Technology Education

A Kentucky Curricular Framework

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TECHNOLOGY EDUCATION

A KENTUCKY CURRICULAR FRAMEWORK

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Ignorance can limit the ability of citizens and their representatives to control the course of technological change. Most technologies are built on a base of specialized knowledge; if most people are incapable of comprehending that knowledge, there looms the danger that the direction of technology will be left to the small cadre who are. When public choices depend on expert information, experts and not the electorate will supply and evaluate this information. If this happens on a widespread scale, democracy becomes an illusion. Citizens can do nothing but accept the judgments of experts and hope that they are right.

Rudi Volti, 2001, Society and Technological Change

INTRODUCTION

Framework Purpose

Technology Education: *A Kentucky Curricular Framework* is designed to assist teachers and administrators in planning, developing, and implementing technology education programs. It presents a philosophical foundation and a broad outline from which educators may construct a comprehensive technology education program. The materials presented will aid in

- Planning curricula,
- Defining scope and sequence,
- Identifying course content and instructional strategies, and
- Identifying links among course content, instructional strategies, and KERA goals and related learner expectations.

Need

Over the last decade, education in the Commonwealth has been characterized by extensive changes and reforms. The Kentucky Education Reform Act (KERA), Tech Prep, the School To Work Opportunities Act, and the transition from Industrial Arts to Technology Education were all designed to enrich educational opportunities and increase learning for all students. Each of these efforts to change school curriculum and student outcomes was expected to create improved learning opportunities by allowing students to expand their range of experiences and practice as critical thinkers, decision makers, life-long-learners, problem solvers, and self-sufficient, responsible citizens, capable of making informed choices.

To key stakeholders in the educational reform community, the purposes of education have been defined to include

- Facilitating individual success and upward mobility;
- Promoting stability and transfer of the culture;
- Promoting local, regional, or global economic competitiveness;
- Preserving democratic institutions through development of an informed citizenry;
- Developing well rounded, educated individuals by encouraging self-fulfillment;
  and
- Enhancing individual opportunity.

Each of these purposes can be met, at least partially, through student participation in quality technology education classroom/laboratory experiences. Toward those ends key stakeholders have identified the need to expand the scope of the knowledge and abilities

students take with them when they leave school to assume the responsibilities of citizenship and employment in a technological world.

We live in a world of rapidly advancing technological developments. In this technological age, the balance of control and application of new and existing technologies exercised by its members determine many important aspects of society. Technology affects society, but society also affects technology (ITEA, 2000). Society needs informed citizens who can balance and control technology-a populace of creative, critical thinkers, who are able to function collectively in an effective manner to manage their technological resources. Technology has changed the institutions of society. All citizens must understand the complex relationships among technology and the powerful institutions that shape and reflect our society. Students (future citizens) must be innovative, knowledgeable, resourceful, skillful and enterprising, so that they can participate effectively in the process of making prudent decisions about our future.

Technology education, once implemented as described in this framework, will be activity-based and truly interdisciplinary. Drawing content from across the disciplines and from diverse work-based and life-based applications, technology education will provide ongoing opportunities for integration with purposeful activity. Technology education has the potential to meet the needs of all students, regardless of background or career aspirations. As they learn through experience, students will have opportunities to examine holistically the interactions of technology and people, culture, and the environment. The knowledge and abilities acquired through technology education will be applied and integrated across disciplines as students solve real-world problems and acquire a broad range of technological knowledge, rich experience, and useful technique.

With its focus on inventing, adapting, designing, constructing and evaluating, the technology education laboratory will be a place where students are encouraged to explore multiple solutions to open-ended problems, take responsibility for personal learning, and develop team-work and management skills (LaPorte & Sanders, 1995). Recognizing the relationship between people and technology, technology education is charged with the responsibility of preparing technologically literate persons equipped with the knowledge and skills needed to live and work in a technologically –oriented and dominated society. Our participation in increasingly competitive world markets makes it imperative that all people understand technology so that they can function as informed voters, productive workers, and wise consumers of products and devices.

OPERATIONAL DEFINITIONS

Technology

Our definition of technology both *reflects* and *affects* our vision of and expectations for technology education. Although *technology* has no single, universally accepted definition, the following operational definition has shaped and is reflected in this Framework:

> *The generation of knowledge and processes to develop systems, that solve problems and extend human capabilities.*

Technology Literacy

The primary purpose of technology education is to create a more technologically literate populace. Technological literacy is:

> *The ability to understand, create, use, manage, and assess technology.*

To further define technological literacy, it is helpful to identify its essential elements, which include experience with, and /or knowledge and understanding of

- ⇒ The Nature of Technology
  - o Characteristics and scope
  - o Core concepts of technology
  - o Relationships between technology and other fields
- ⇒ Technology and Society
  - o Cultural, social, economic, and political effects
  - o Effects of technology on the environment
  - o Role of society in the development of technology
  - o Influence of technology on history
- ⇒ Design
  - o Attributes of design
  - o Engineering design
  - o Role of troubleshooting, research and development, invention, innovation, and experimentation
- ⇒ Abilities for a Designed World
  - o Application of the design process
  - o Use and maintain technological products and systems
  - o Assess the impacts of products and systems
- ⇒ Designed World
  - o Medical technologies
  - o Agricultural and related bio-technologies
  - o Energy and Power technologies
  - o Information and Communication technologies
  - o Transportation technologies
  - o Manufacturing technologies
  - o Construction technologies

TECHNOLOGY EDUCATION IN KENTUCKY

Origins

Considering only physical capabilities, humans do not compare favorably to other species. Humans lack the speed, flying ability, acute senses, temperature tolerations, and a host of other attributes that contribute to survival. What humans have, however, is the ability to develop technology. Technology allows the modern human to travel faster, fly higher, sense more acutely, and survive in hostile environments far beyond any animal. The ability to develop technology has determined who survives a draught, who thrives economically, who wins a war, and ultimately, whose culture continues and whose disappears. Any force that has had such a dramatic impact on human survival, historical development, and future prosperity, is worthy of in-depth study.

In the 1880's, Calvin Woodward, a professor at Washington University in St. Louis, took note that industry and its accompanying ideas of efficiency were having a dramatic effect on the shaping of modern society. He surmised that the general public must understand such a dramatic force if it was to be best utilized and controlled in a democratic system. He introduced Manual Training as a general studies requirement for all students. Dr. Woodward wrote:

> *"The word "manual" must, for the present, be the best word to distinguish that peculiar system of liberal education which recognized the manual as well as the intellectual. I advocate manual training for all children as an element of general education. I care little what tools are used, or how they are used, so long as proper habits (morals) are formed, and provided the windows of the mind are kept open toward the world of things and forces, physical as well as spiritual." (Woodward, 1898).*

Manual Training spread rapidly with thousands of school districts offering courses by the early 1900s. An interesting note, however, is that the underlying concept of Manual Training as an integral part of liberal education was lost almost immediately. Manual Training was interpreted as pre-vocational. The tools that were being used and how they were used became paramount.

Throughout the 1900s, several reform efforts were introduced. Through the reforms, the name was changed to Manual Arts, then Industrial Arts, and later Industrial Technology. Each reform sought to return the focus to liberal arts and insert it into the general education core. These efforts met with very limited success.

By 1990, it was obvious that industry was no longer the primary force shaping modern society. Technology had taken that role. Manufacturing accounted for an ever-decreasing percentage of the Gross National Product. This trend has continued so that currently the majority of employment positions involve the creation, management, and use of information. An educational response to the Information Age was necessary.

Clearly the most dominant icon of the Information Age is the computer. No other single device, with the exception of possibly gunpowder, has had such a tremendous impact on how things are done. Schools responded by purchasing computers, conducting computer courses, and organizing the system with a technology committee. This emphasis and expenditure on technology led to a common misconception that computers comprise the whole of technology.

A return to the foundational concepts of the discipline in the words of Calvin Woodward may be helpful at this point. The computer is but a tool. In that manner, it is no different than a metal lathe, table saw, or chisel. Teaching only the use of the tool ignores the larger, more enduring concept of the forces shaping society because of the use of the tool.

Technology Education

The program of studies for Technology Education as outlined in this document presents current understanding of the body of knowledge that comprises the whole of technology. This content is organized into a series of courses that allow the technology student to explore and discover the many facets of technology and how it shapes our society. The activities engage students in the study of the development and impacts of technology in a manner that is interesting and fun. Many, if not all, technology activities draw heavily on the interdisciplinary nature of technology. Students find that concepts addressed in other academic disciplines are applied through their technology education studies.

With the goal of producing technologically literate students, the Technology Education program should provide opportunities to

- ⇒ Apply creative problem-solving, critical thinking, teamwork, leadership, acceptance of personal responsibility and other skills using a variety of resources (including information, tools, and materials) to identify/define/solve problems.
- ⇒ Design, build, test, and modify products and solutions to problems
- ⇒ Develop a conceptual understanding of technological contexts (e.g., medical, agricultural, communication, transportation, power and energy, manufacturing, and construction) and the interrelationship between the resource/input, process, output, and feedback elements of these systems.
- ⇒ Use contemporary technologies to communicate, process, manipulate, collect, and apply information to solve technical problems.
- ⇒ Integrate and apply concepts from Kentucky Core Content to contemporary technology.
- ⇒ Develop competencies in the safe and efficient use of tools, machines, materials, and processes.
- ⇒ Identify opportunities, characteristics, and preparation requirements for current and emerging technological occupations.
- ⇒ Explore entrepreneurship and its place within the free enterprise system as a means to becoming a self-sufficient individual.

⇒ Understand and appreciate both the importance and the dynamic nature of technology.

⇒ Prepare for the challenges of a dynamic world through gaining skills in technological literacy, leadership, and problem solving, resulting in personal growth and opportunity.

The content of the discipline of technology education is defined by twenty standards developed through national consensus of educators and leaders in business, industry, and research. These standards consist of two main parts; the Content Standards (#1-13) and the Context Standards (#14-20). The primary shift of this Program of Studies as compared to those of the past is the focus on the Content. Over the past 23 years, the Program of Studies has been organized by the Context standards. Although this assures a broad spectrum of activities, it does not assure that the content is being addressed. This program of Studies is organized by Content, not Context. It is the consensus of curriculum developers and other leaders in the field that by stating the content clearly, any, and all, contexts can be used. The context becomes the vehicle for the content. The specific context is not dictated.

Technology Education is not synonymous with career and technical education, educational technology or computer education. The primary purpose of technology education is to promote and develop technological literacy in each and every student. A technologically literate person understands the nature of technology, how technology relates to society, can describe and use the design process, and has a conceptual knowledge of technological systems in a variety of contexts, fields, disciplines, and/or careers. Technology education does not provide training for a specific job or occupation, as is the goal of career and technical education. Technology education should not be confused with educational technology, which is simply the use of technological devices in the process of teaching. Technology Education is not comprised entirely by teaching students how to use a computer, although computers are used in many technology education activities.

Technology education is an integral part of each school's comprehensive program, which directly supports Kentucky's Learning Goals and Academic Expectations as specified by the Kentucky Education Reform Act (KERA) of 1990.

Recommended Courses

Course Title	Recommended Grade Level							Recommended Credit
	6	**7**	**8**	**9**	**10**	**11**	**12**	
Introduction to Technology	x	x						½
Technology Inventions and Impacts		x	x					½
Technology Systems			x	xx				½ *
Special Technology Topics	x	x	x	xx				½ **
xx Only when 9th grade is housed at the middle school *Credit is granted only when offered at the 9th grade level **This course may be scheduled for 1 year or 2 semesters and credit granted only when offered at the 9th grade level								
Career Major: Technology Education								
Technology Concepts				x	x			1
Technology Design and Applications				x	x	x		1-2 *
Impacts of Contemporary Technology					x	x	x	1-2*
Conceptual Engineering Technology						x	x	1-2*
Special Problems in Technology Education				x	x	x	x	1-4*
Special Technology Topics				x	x	x	x	1-4*
*One credit granted each time the course is successfully completed.								
Career Major: Pre-Engineering								
Pre-Engineering (Project Lead The Way)				x	x	x	x	6 total, 1 each class

Elementary School Program

Technology Education at the elementary school level takes an integrated approach. At this level students are made aware of technology and its impact on the world around them. Students explore technology through age-appropriate, hands-on, minds-on activities that include problem solving, creative and critical thinking, and working in teams within thematic units. The Standards for Technological Literacy include benchmarks for learning at the K-2 and 3-5 grade levels.

Implementation of technology education at the elementary school level is best achieved through consultation and cooperation among elementary and technology education teachers. Kentucky schools are encouraged to include Technology Education at these grade levels as possible.

Middle School Program

Technology education programs in the middle school provides an introduction to technology as a specific field of study and how it connects and applies skills from other academic disciplines. Students experience the design process as they invent devices to solve various problems. They learn of system requirements, processes and controls as they wrestle with trade-off due to design constraints. They learn the proper and safe operation of some basic tools as their ideas begin to take shape. Through these experiences, they begin to understand the forces that drive our technological society and how these forces can be controlled and directed. Instructional approaches vary, including problem solving/design briefs where students build projects, small/large group instruction, discussion, research, student presentations, and other successful pedagogy. Carefully designed curriculum for modular technology labs can also be an effective means of instruction. Schools are encouraged to include Technology Education as an equal component of interdisciplinary team teaching. Technology Education at the middle school level should include a Technology Student Association and can incorporate many of the TSA activities within the curriculum.

A technology education (middle school) course is generally offered for six to eighteen weeks for a single class period each day. Alternative schedules that provide for equivalent contact hours may also be implemented. A total program of technology education consists of a minimum of three course offerings, one for each grade level (6-8). Additional courses are available for unique individual or team study. Due to the variable nature of Middle School scheduling of Technology courses, *Content/Processes* listed for each course are recommended but may not be feasible in totality.

It is strongly recommended that students complete one or more of the other courses before enrolling in the Special Topics course.

High School Program

Technology education at the high school level is a broad-based program addressing many aspects of our technologically dependent society through various contexts. Instructional activities provide students with knowledge and skills concerning the function and operation of various technological devices. The High School technology education program also immerses the student in decisions concerning technology, analyzing the impacts and assessing various technological issues. These educational goals can be accomplished through a variety of means, including, but not limited to research and presentations, discussions, and field experiences. The design, construction, and testing of various projects using a variety of contexts is imperative for successful instruction in the technology education program.

Although an introduction to engineering course is offered within the technology education sequence, technology education does not specifically lead to a career in

engineering. An accurate analogy would be that high school mathematics courses do not necessarily lead to a career as a mathematician.

All programs are required to make provisions to meet the needs of disadvantaged and disabled students. If the nature and severity of the disadvantage or disability is such that the student cannot benefit from program participation, a separate or modified program may be developed. In either case, the program provided shall be consistent with and specified in each special needs student's Individualized Education Program Plan (IEP). The extensive use of laboratory equipment in technology programs may require the provision of teacher aides to assist disabled students (if identified as a component of the IEP).

Student organizations are an integral component of a technology education program at both the middle school and high school levels. The student organization should encompass activities associated with program content, provide leadership opportunities, recognize skill development, and enrich the education program through student motivation and group activities. It is recommended that Technology Education programs be represented by the Technology Student Association (TSA). Districts seeking Perkin's Act funding for Technology Education programs at the high school level are required to include the student organization (TSA) as an integral part of the instructional program.

The Kentucky Curricular Framework for Technology Education includes two career major options; Technology Education and Pre-Engineering. Both career majors address the Standards for Technological Literacy and are designed to result in technologically literate graduates. They achieve these goals, however, through different approaches.

The courses for the Technology Education career major are, for the most part, designed by the local instructor/curriculum specialist. Many resources are available to aid this process. Teachers will find curriculum materials developed at the state and national levels to be particularly helpful. All courses in the Kentucky program are derived from materials developed through the Center for Advancement of Teaching Technology and Science (CATTS). These materials are a product of several years of development by a multi-state consortium. Teachers are encouraged to follow the format and content of the CATTS curriculum materials as they design and teach courses.

A commercially produced program known as Project Lead The Way (PLTW) determines courses in the Pre-Engineering career major. Project Lead The Way is a comprehensive program that has undergone years of development and research. Several courses have been designed that are offered in sequence. Stringent requirements have been set up to assure the quality of the delivery of PLTW instruction. A school wishing to pursue the Pre-Engineering major should contact the Division Of Career and Technical Education, Kentucky Department of Education or Project Lead The Way organization at http://www.pltw.org/aindex.htm for a complete

listing of courses, required teacher training, tools, materials and other components of the program. Although other organizations may be formed with various curriculum materials in the future, Project Lead The Way should be considered the only option for fulfilling the Pre-Engineering career major for this Curricular Framework.

Assessment of Technological Literacy

The Kentucky Department of Education has implemented a State-level assessment of technological literacy. Currently this assessment is administered to all students who have completed two Technology Education courses. The content of this assessment is based on the Kentucky Skill Standards (see appendix), which include the Standards for Technological Literacy and certain KERA and SCANS requirements. **The assessment assumes that students are taking the courses outlined by this Kentucky Curricular Framework for Technology Education.**

Conclusion

Technology Education courses develop and enhance students' technological literacy or understanding of how technological systems function and impact society, the environment, and the global economy. Technology Education is activity based and includes topics related to invention, intervention, and innovation. Technology Education addresses individual rights and responsibilities. It provides opportunities for students to understand technology's impact on their lives. Technology Education will enable students to manage and cope with change. Students learn to apply tools, materials, processes and concepts efficiently as these relate to technology. In addition, students develop and apply creative problem solving techniques and critical thinking skills as they apply their knowledge of Kentucky Core Content to solve realistic problems. Students become wise consumers of technology. They become aware of the multitude of careers and make intelligent career choices. Technology Education should be available to all students. Although course content is sequential, no prerequisites are required in the program.

Technology Education must perpetuate its willingness to change as necessary to meet the ever-changing needs of society. The recommended course descriptions in this Framework are responsive to current needs while remaining flexible enough to address the inevitable changes that will occur before the next revision. This latitude is not only intentional but essential. It allows for the professional (certified Technology Education teacher) educator to address changing societal needs.

Kentucky Education Reform Act (KERA)

When carefully implemented, technology education learning experiences provide unique opportunities to help students achieve many of the six learning goals and fifty-six learning expectations that are the centerpiece of the Kentucky Education Reform Act (KERA). Table 1 relates the six KERA Goals to program goals for technology education. Note that all six KERA Goals are strongly reflected in the Technology Education goals

for Kentucky. The conceptual framework identifies no single curriculum or set of content-based learning activities. The content of each specific Technology Education program should reflect the individual student and community needs in specific schools. The learning expectations linked to each KERA goal should be identified at the specific local program level and matched to learning outcomes, which will result from specific learning experiences and activities.

Secretary's Commission on Achieving Necessary Skills (SCANS)

In 1990, the Secretary of Labor appointed a commission to determine the skills our young people need to succeed in the world of work. The commission's fundamental purpose was to encourage a high-performance economy characterized by high-skill, high-wage employment. Although the commission completed its work in 1992, its findings and recommendations continue to be a valuable source of information for individuals and organizations involved in education and workforce development. (Dept. of Labor)

Although Technology Education is not a specific career focused program, The Kentucky Curricular Framework for Technology Education includes content from the SCANS Report (see appendix).

Goals of Technology Education (Table 1)

KERA GOALS	GOALS OF KENTUCKY TECHNOLOGY EDUCATION
Goal 1: Students are able to use basic communication and mathematics skills for purposes and situation they will encounter throughout their lives.	Students shall: • utilize academic and technological skills to solve real life problems, and • integrate technological knowledge with past experiences from various academic disciplines to further the development of lifetime learning skills.
Goal 2: Students shall develop their abilities to apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies, practical living studies and vocational studies to what they will encounter throughout their lives.	Students shall: • experience and understand tools, equipment, materials processes and technological concepts, and • apply science, math, communication and history skills to the solution of technological problems.
Goal 3: Students shall develop their abilities to become self-sufficient individuals.	Students shall: • experience success in action based technology education activities, • use appropriate data and information to explore careers in technology related occupations, and • develop the technological knowledge necessary to be a self sufficient individual and to make intelligent career choices.
Goal 4: Students shall develop their abilities to become responsible members of a family, work group, or community, including demonstrating effectiveness in community service	Students shall: • develop leadership techniques, communication skill, and creative abilities through student organizations
Goal 5: Students shall develop their abilities to think and solve problems in school situations and in a variety of situations they will encounter in life.	Students shall: • investigate and use materials, information and systems, • consider and use the resources, techniques and equipment that are relevant to a particular context, and • utilize critical thinking and problem solving skills to identify and solve problems in situations which will be encountered throughout life.
Goal 6: Students shall develop their abilities to connect and integrate experiences and new knowledge from all subject matter fields with what they have previously learned and build on past learning experiences to acquire new information through various media.	Students shall: • apply science, math, communication and history skills to the solution of technological problems, and • become a “technology wise” consumer.

CURRICULUM FRAMEWORK (Table 2)

LEVEL	COURSES	CONTENT	DELIVERY VEHICLES	KNOWLEDGE & SKILL ACHIEVEMENT GOALS
Primary/Elementary Awareness	Included as units to supplement and enrich instruction	Technological systems Safety Basic tool skills Impact assessment Design Production of products Career awareness Consumerism Entrepreneurship	Broad thematic units.	Awareness Exploration Comprehension Critical Thinking Skills Problem Solving Skills
Middle School/ Junior High School (6-8) Exploratory	Introduction to Technology Tech. Inventions and Impacts Technological Systems Special Technology Topics	Technological systems Safety Basic tool skills Design Production of products Career awareness Consumerism Entrepreneurship Impacts of technology History of technology	Individual &/or group work using modules &/or design briefs.	Awareness Exploration Comprehension Critical Thinking Skills Problem Solving Skills
High School Introductory	Technology Concepts Tech. Design &Applications Impacts of Contemporary Tech. Conceptual Engineering Tech. Special Problems in Tech. Special Tech. Topics	Technological Contexts Safety Basic tool skills Impact assessment Design Production of products Career awareness Consumerism Entrepreneurship History of technology Issues	Individual &/or group work using modules &/or design briefs.	Awareness Exploration Comprehension Application Analysis Synthesis Evaluation Critical Thinking Skills Problem Solving Skills

Middle School Courses

Introduction to Technology

Students develop an understanding of the progression and scope of the technological systems (Energy and Power, Information and Communication, Transportation, Manufacturing, Construction, Medical, Agriculture and Bio-Related Technologies) through exploratory experiences. Using tools, machines, materials, and processes students will engage in group and/or individual activities to gain knowledge and experience with the design process. This can be accomplished through modular or other instructional strategies with participation in Kentucky Technology Student Association challenges. This course may be 6 to 18 weeks in duration.

(This course derives content from the CATTS Exploring Technology guide)

Academic Expectations	Content/Process	Standards for Technological Literacy
1.2, 1.3, 2.1, 5.1, 6.2	**Students will:** • define technology.	A2
1.3, 2.13, 2.18, 5.1, 5.4, 6.3,	• identify and become aware of ways technology has been used to meet human needs in the home, school, community, and workplace.	A3, A4, D1-4
6.3	• use technological terminology correctly.	A1-3, G4, Q4
2.1, 2.3, 5.1, 5.2, 6.2	• explore technological concepts and processes in the contexts of communication, transportation, manufacturing, construction, power and energy, medical, agriculture and bio-related, and emerging technological systems.	B1-6, N1-T4
1.11, 1.16, 2.2, 2.18, 5.2, 6.2, 1.3, 2.1, 5.1, 5.3, 6.1, 2.17, 3.4, 4.5, 4.6, 5.5, 6.3	• develop and use problem solving and decision making skills to invent, design, and modify devices and systems.	H1-J3
2.3, 3.2, 5.1, 6.1	• use tools, machines, and materials in a safe, efficient, and effective manner.	L1-4
1.2, 1.16, 2.1, 5.1, 6.3, 2.20, 4.6, 5.4, 6.2	• gather, analyze, and communicate technical information by measuring, reading, and analyzing drawings and other technical sources.	M1-4

1.11, 1.16, 5.1	• develop technical writing skills using appropriate forms, conventions and styles to communicate ideas and information.	Q1-4
1.16, 5.1,	• understand that computers and software are versatile tools used to collect, organize, process, and communicate information and ideas.	Q4, M1, L3, L4
1.4, 1.12, 2.26, 2.36, 3.3, 4.1, 4.2	• explore employability and social skills relative to careers.	N1-T4
1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	• develop personal and professional leadership through association with KY TSA.	A1-T4
1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5, 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2	• apply concepts from the Kentucky Core Content in the context of Technology Education.	A1-T4
2.3, 5.3	• Identify and implement the components of a systems model through demonstration	B1-6, C1-3
1.16, 2.1, 5.1, 5.2	• Analyze the evolution of technological systems and their impacts on society	C1-G4, M1-4
3.5, 4.4, 2.37, 3.3, 3.7, 4.1, 4.2, 4.3, 4.5, 4.6	• Develop and demonstrate strategies and work habits that will lead to success and prepare the student for a future careers in a technological world.	D1-4, C3, F1-4, N1-T4
Connections		

• Kentucky Technology Student Association (KY TSA) • Technology Education Teacher Resource Kit and SCANS Skills • National Technological Literacy Content Standards • International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium	

Technology Inventions and Impacts

Students will investigate how commercially produced inventions/innovations impact us on a personal, social, economic, and environmental level. Using tools, machines, materials, and processes students will participate in engineering design activities to understand how criteria, constraints, and processes affect inventions. Brainstorming, visualizing, modeling, constructing, testing, and refining designs provide first-hand opportunities for students to understand the uses and impacts of inventions; past, present, and future. Students will develop skills in communicating design information and reporting results. This can be accomplished in a laboratory environment through a variety of instructional strategies. Instruction can be enriched through participation in Kentucky Technology Student Association challenges. This course may be 6 to 18 weeks in duration.

(This course derives content from the CATTS Invention and Innovation guide)

Academic Expectations	Content/Process	Standards for Technological Literacy
1.2, 1.3, 2.1, 5.1, 6.2, 6.3	**Students will:** • Define technology and use technological terminology correctly.	All (A-T)
1.3, 2.17, 3.6, 4.5, 5.1, 5.4, 6.2, 6.3, 2.1, 2.19	• Identify and become aware of ways technology has been used to satisfy human needs and environmental concerns.	D1-4, E1-3, F1-4, H1
1.3, 2.17, 2.18, 2.19, 3.6, 4.5, 5.1, 5.4, 6.2, 6.3, 2.1	• Evaluate the impacts of technological inventions and innovations on people, society, culture, and the environment.	D1-4, F1, F2-3, M1-4
1.12, 4.4, 5.5	• Identify opportunities for problem solving	A4, F1

5.4, 5.5, 6.1	• Develop and use problem solving and decision making skills (brainstorming, visualizing, modeling, constructing, testing, and refining, etc.) to invent, design, create, and modify devices and systems.	H1-3, I1-3, J1-3, K1-5, L1-4, M1-4
1.12, 4.4, 5.5	• Apply a problem-solving system.	H1-3, I1-3, J1-3, K1-5, L1-4, M1-4
1.11, 1.16, 2.2, 5.2, 5.3, 5.4, 6.2	• Implement elements of form and function to the design process.	H1-3, K1-5
2.3, 3.2, 5.1, 6.1	• use tools, machines, and materials in a safe, efficient, and effective manner.	L1-4
1.3, 2.1, 2.17, 3.6, 5.1, 5.4, 6.2	• Identify and analyze current and emerging issues (e.g., ethical, social, legal, environmental, political, and privacy) related to technology.	D1-4, E1-3, F1-4, G1-4
2.1, 2.19, 2.33, 5.3, 6.1, 6.2	• Describe intended and unintended impacts of the application of technological solutions.	D1-4, E3, F3-4
1.3, 2.2, 4.6, 5.1, 5.4, 6.3	• Identify appropriate and inappropriate applications of technology.	D1-4, E3, M1-4
2.18, 5.1, 5.4, 6.3	• Analyze how and why societal demands impact invention and innovation.	A4, F1-4, J2
2.2, 5.1, 6.1, 6.2, 6.3	• Identify that a product, system, or environment developed for one setting may be applied to another setting. Understand that innovations are alterations of previous inventions.	B1, C1-3, F2, J2
2.3, 5.2, 5.3, 6.3	• Understand the relationship between Technology and Creativity, and how it has resulted in inventions and innovations.	A3, F2, J2, K1
2.18, 2.1, 2.2	• Understand and utilize the patent process.	A4, D1-4, F1-2, F4, H1-3, M3
1.4, 1.12, 2.26, 2.36, 3.3, 4.1, 4.2	• explore employability and social skills relative to careers involving invention and innovation.	A3, C3, F1-2, G2, J2
1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4,	• develop personal and professional leadership through association with KY TSA.	D1-4

4.5, 4.6, 5.1, 5.4, 5.5		
1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5, 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2	• apply concepts from the Kentucky Core Content in the context of Technology Education.	C-3
3.5, 4.4, 2.37, 3.3, 3.7, 4.1, 4.2, 4.3, 4.5, 4.6	• Develop and demonstrate strategies and work habits that will lead to success and prepare the student for a future careers in a technological world.	D1-4, C-3, F1-4, N1-T4

Connections

- Kentucky Technology Student Association (KY TSA)
- SCANS Skills
- National Technological Literacy Content Standards
- International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium

Technology Systems

This course contains units of study addressing content and processes associated with technological systems and their various relationships. Students apply systems concepts to design and problem-solving activities related to Energy and Power, Information and Communication, Transportation, Manufacturing, Construction, Medical, Agriculture and Bio-Related Technologies. Laboratory activities engage students in using, managing, assessing, and understanding technology. This can be accomplished in a laboratory environment through a variety of instructional strategies. Instruction can be enriched through participation in Kentucky Technology Student Association challenges. This course may be 6 to 18 weeks in duration.

(This course derives content from the CATTS Technological Systems guide)

Academic Expectations	Content/Process	Standards for Technological Literacy

1.2, 1.3, 2.1, 5.1, 6.2, 6.3	**Students will:** • Define technological systems	C1, N1, O1, P-1, Q1, R1, S1, T1
1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5, 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2	• Apply concepts from the Kentucky Core Content in the technological systems context.	C3
2.1, 2.3, 5.1, 5.2, 6.2	• Explore technological concepts and processes in the contexts of energy and power, information and communication, transportation, manufacturing, construction, medical, agricultural and bio-related technologies in emerging technological systems/sub-systems.	L1-3, E3, M3&4
1.12, 4.4, 5.4, 5.5, 6.1	• Design, test, evaluate, and modify models within technological systems.	H1-3, I1-3, K 1-3,
2.3, 3.2, 5.1, 5.5, 6.1	• Solve basic technological problems using tools, machines, materials, and processes in an applied project-based approach.	L2&4, B5, H1-3
1.3, 2.1, 2.17, 3.6, 5.1, 5.4, 6.2, 2.19, 2.33, 5.3, 6.1	• Analyze current and emerging issues (e.g. ethical, social, legal, environmental, political, and privacy) related to a wide variety of technological systems.	B2&5, G3, I3, L2, O2, P2, S3, S5, T4
3.5, 4.4, 2.37, 3.3, 3.7, 4.1, 4.2, 4.3, 4.5, 4.6	• Develop and demonstrate strategies and work habits that will lead to success and prepare the student for a future careers in a technological world.	D1-4, C3, F1-4, N1-T4
2.1, 2.3, 5.1, 5.2, 6.2	• Demonstrate and apply an understanding of technological systems and the relationships between the resources/input, processes, output, and feedback elements of these systems.	A1-4, B1, C1, N1, O1, P1, Q1, R1, S1, T1
2.1, 2.19, 2.33, 5.3, 6.1, 6.2	• Analyze the changing nature and impacts of a variety of technological systems.	D1-4, E1-3,G1-4
2.38, 1.4, 1.12, 2.26, 2.36, 3.3,	• Identify current and emerging occupations related to a variety of technological systems.	F1-3, N1-T4, B1, C3, D4

4.1, 4.2		
1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	• Develop personal and professional leadership skills through association with the KY TSA.	All (A-T)
1.4, 1.12, 2.26, 2.36, 3.3, 4.1, 4.2	• Identify, analyze, and compare current and emerging jobs, careers, and occupations relating to a variety of technological systems.	A3, C3, D1-4, F1&3, G2, L-2&4, M3
Connections • Kentucky Technology Student Association (KY TSA) • SCANS Skills • National Technological Literacy Content Standards • International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium		

Special Technology Topics

Special Technology Topics allows the teacher to develop a course for in-depth exploration of technological topics. This course will allow students to gain a more comprehensive knowledge of a particular technology topic or explore specialized technology careers. This can be accomplished in a laboratory environment through a variety of instructional strategies. Instruction can be enriched through participation in Kentucky Technology Student Association challenges and/or Project Lead the Way-Gateway to Technology program materials. This optional/additional course may be 6 to 18 weeks in duration and may be taught at any grade level as appropriate.

Academic Expectations	Content/processes	Standards for Technological Literacy
All	**Students will:** • Apply concepts found in the Standards for Technological Literacy	All standards 1-20
1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1,	• apply concepts from the Kentucky Core Content in the context of Technology Education.	All standards 1-20

4.2, 4.3, 4.4, 4.5, 4.6, 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5, 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2		
3.5, 4.4, 2.37, 3.3, 3.7, 4.1, 4.2, 4.3, 4.5, 4.6	• Develop and demonstrate strategies and work habits that will lead to success and prepare the student for future careers in a technological world.	D1-4, C3, F1-4, N1-T4
1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	• Develop social and professional leadership skills through association with KY TSA	All standards 1-20
1.1, 1.2, 1.3, 1.4, 1.11, 1.12	• Utilize the interactive (team) process for engineering design	I1-3
1.2, 1.16, 2.1, 5.1, 6.3, 2.20, 4.6, 5.4, 6.2	• Use instruments to collect and analyze data	M1
2.38, 1.4, 1.12, 2.26, 2.36, 3.3, 4.1, 4.2	• Identify current and emerging careers related to technology	Standards 14-20
2.3, 3.2, 5.1, 6.1	• develop competencies in the safe, efficient, and effective use of tools, machines, materials, and processes.	Standards 14-20

Connections

- Kentucky Technology Student Association (KY TSA)
- SCANS Skills
- National Technological Literacy Content Standards
- International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium

High School Courses

(Career Major: Technology Education)

Technology Concepts

This introductory course provides opportunities for students to study and apply technological systems, concepts, and processes. Group and individual activities engage students in creating ideas, developing innovations, and implementing design solutions utilizing the seven contexts of technological literacy (medical, agriculture and bio-related technologies, construction, manufacturing, transportation, power and energy, and communication systems). Technology content, resources, and laboratory activities encourage student applications of Kentucky Core Content. This can be accomplished through modular or other instructional strategies. Instruction should be enriched through participation in Kentucky Technology Student Association challenges. This course may be 18 or 36 weeks in duration.

(This course derives content from the CATTS Foundations guide)

Academic Expectations	SCANS	Content/Process	Standards for Technological Literacy
OA: 1.16, 1.2, 1.3, 2.1, 2.13, 2.18, 2.2, 2.3, 5.1, 5.3, 5.4, 6.2, 6.3 OG: 1.16, 1.2, 2.16, 2.18, 2.19, 2.2, 5.3, 5.4, 6.1, 6.2	C1, C2, C3, C4, C5, C6, C7, C11, C12, C15, C17, C18, C19, F1, F7, F8, F9, F11 F12, F13	**Students will:** • Define and describe the nature of technology.	OA1-4, OB1-6, OG1-9
OD: 1.3, 2.1, 2.17.2.18, 2.2, 2.26, 3.6, 4.5, 5.1, 5.2, 5.4, 6.2, 6.3	C5, C10, C11, C14, C17, C19, F5, F7, F8, F9, F16, F17	• Demonstrate an awareness of current and emerging issues (e.g., ethical, social, legal, environmental, political, and privacy) related to technology.	OD1-4
OM: 1.16, 1.2, 2.1, 2.2, 2.6, 4.6, 5.1, 5.4, 6.1, 6.2, 6.3	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C14	• Explore technological concepts and processes in the contexts of (Energy and Power, Information and Communication, Transportation, Manufacturing,	OM1-4, ON1-4, OO1-4, OP1-5, OQ1-6, OR1-5, OS1-7, OT1-5

ON: 2.3, 2.6, 3.1, 3.2, 3.6, 4.6, 6.1, 6.3 OO: 1.1, 2.1, 2.13, 2.18, 2.3, 2.6, 3.6, 4.6, 6.1, 6.3 OP: 1.11, 1.16, 1.3, 2.1, 2.18, 2.2, 2.3, 2.33, 4.6, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3 OQ: 1.12, 1.16, 2.1, 2.17, 2.18, 2.3, 4.1, 4.2, 4.5, 5.1, 5.4, 5.5, 6.1, 6.2, 6.3 OR: 2.16, 2.18, 2.2, 2.3, 5.2, 5.3, 6.1, 6.2, 6.3 OS: 1.10, 1.3, 2.1, 2.18, 2.3, 2.4, 2.8, 5.1, 5.4, 6.1, 6.3 OT: 1.11, 1.16 1.3, 2.1, 2.17, 2.18, 2.3, 2.33, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3	C15, C16, C17, C18, C19,C20, F1, F2, F3, F5,F6, F7, F8, F9, F10,F11, F12, F13, F15, F16, F17	Construction, Medical, Agriculture and Bio-Related Technologies).	
AB: 2.7, 2.8, 2.9, 2.10, 5.5 EC: 1.12, 1.3, 4.4, 5.4, 5.5, 6.1 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 5.4, 6.1, 6.2 OK: 1.12, 1.2,	C2, C3, C4, C5, C6, C7, C8, C9, C11, C12, C13, C15, C17, C18, C19, C20, F1, F2, F3, F4, F5, F6, F7, F8,	• Apply technological concepts (such as simple machines, circuits, sketching, fluid systems, etc…) to solve technical problems.	AB3, EC1-3, OC1,2,4, OK1-6, OP1&2, OQ1,2,4,5,6, OR1,5, OS3,4,7, OT2

1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3 OP: 1.16, 2.18, 2.2, 2.33, 4.6, 5.3, 5.5, 6.1, 6.3 OR: 2.18, 2.2, 2.3, 5.3, 6.2, 6.3 OS: 1.3, 2.1, 2.18, 2.8, 5.1, 6.1 OT: 1.11, 1.16, 2.3, 2.17, 2.33, 5.2, 6.1	F9, F10, F11, F12, F13, F15, F17		
OF: 1.11, 1.3, 2.1, 2.17, 2.18, 2.19, 2.2, 2.25, 2.26, 2.3, 2.33, 3.6, 4.5, 5.2, 5.3, 5.4, 6.2, 6.3 OG: 1.16, 1.2, 2.16, 2.18, 2.19, 2.2, 5.3, 5.4, 6.1, 6.2	C1, C2, C3, C4, C5, C7, C8, C9, C10, C11, C14, C15, C16, C17, C18, C19, F1, F2, F5, F7, F8, F9, F10, F11, F12, F13,	• Demonstrate an understanding of the dynamic nature of technology, analyze and interpret historical events, conditions, trends and issues to develop perspective on the impacts of technology on people, society, culture, and the environment.	OF1-3, OG1-9
EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5	C4, C5, C6, C7, C9, C10, C11, C13, C14, C16, F1, F2, F5, F6, F8, F9, F11, F12, F13, F15, F16, F17,	• Identify opportunities, characteristics, and preparation requirements for occupations in current and emerging technology.1	EA1-6, EB1-6, EF1-9

EF: 1.1, 1.11, 1.12, 1.2, 1.3, 1.4, 2.17, 2.26, 2.29, 2.32, 3.3, 3.5, 3.6, 4.1, 4.2, 4.4, 4.5, 4.6, 5.2, 5.3, 5.4			
EG: 1.1, 1.11, 2.36, 2.37, 2.38, 3.1, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5 AD: 1.2, 1.4, 3.1, 3.3, 3.7, 5.1, 5.3, 5.4 EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5	C1, C3, C4, C5, C6, C7, C8, C9, C11, C12, C14, C15, C16, C19, F1, F2, F5,F6, F8, F9, F11, F12, F13, F14, F15, F16, F17	• Develop and demonstrate strategies and work habits that lead to success.	EG1-18, AD1-4, EB1-6
EC: 1.12, 1.3, 4.4, 5.4, 5.5, 6.1 OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3	C2, C3, C4, C5, C7, C13, C15, C17, C19, C20, F1, F2, F3, F4, F6, F7, F8, F9, F12, F13, F17	• Demonstrate an understanding of technological systems and the interrelationship between the resource/input, process, output, and feedback elements of these systems.	EC1-3, OK1-6
EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 5.4, 6.1, 6.2 OO: 2.18, 2.3, 2.6 OS: 1.1, 2.3,	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C12, C14, C15, C16, C17, C18, C19, C20, F1, F2, F4, F5, F6, F7, F8, F9,	• Develop competencies in the safe, efficient, and effective use of tools, machines, materials, and processes.	EB1-6, OC1-4, OO1, OS2, 4, OT2-5

2.8, 5.1, 5.3, 6.1 OT: 1.11, 1.16, 2.17, 2.18, 2.3, 2.33,5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3	F10, F11, F12, F13, F16, F17		
AD: 1.2, 1.4, 3.1, 3.3, 3.7, 5.1, 5.3, 5.4, EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 OH: 1.11, 1.16, 1.3, 2.1, 2.18, 2.1, 2.2, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3 OI: 1.11, 1.16, 1.2, 2.1, 2.17, 2.18, 2.3, 2.33, 3.4, 4.5, 4.6, 5.2, 5.4, 6.2, 6.3 OJ: 1.1, 2.1, 5.1, 5.3, 6.1, 6.2, 6.3 OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3	C1, C2, C3, C4, C5, C6, C7, C9, C12, C13, C15, C16, C17, C18, C19, C20, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17	• Communicate design solutions through formal and informal presentations.	AD1-4, EA1-6, OH1-4, OI1-4, OJ1-4, OK1-6
OM: 2.1, 2.2, 2.6, 6.1 OQ: 1.12, 1.16, 2.1, 2.17, 2.18, 2.3, 4.1, 4.2,	C1, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16,	• demonstrate team, social, and employability skills relative to careers.	OM4, OQ3-6 EA1-6, EB1-6, EF1-9, EG1-18

4.5, 5.1, 5.4, 5.5, 6.2, 6.3 EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 EF: 1.1, 1.11, 1.12, 1.2, 1.3, 1.4, 2.17, 2.26, 2.29, 2.32, 3.3, 3.5, 3.6, 4.1, 4.4, 4.5, 4.6, 5.2, 5.4 EG: 1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	C17, C18, C19, F1, F2, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17		
EG: 1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	C1, C3, C4, C5, C6, C7, C8, C9, C11, C12, C14, C15, C16, C19, F1, F2, F5, F6, F8, F9, F11, F12, F13, F14, F15, F16, F17	• develop personal and professional leadership skills through participation in the Kentucky Technology Student Association	EG1-18

AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 AB: 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2	C3, C4, C5, C6, C7, C8, C9, C15, C17, C19, F1, F2, F3, F4, F5, F6, F7, F9, F11, F12, F17	• apply concepts from Kentucky Core Concepts in the context of technology education.	AA1-8, AB1-10, OC1, OC4
Connections • Kentucky Technology Student Association (KY TSA) • SCANS Skills • National Technological Literacy Content Standards • International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium			

Technology Design and Application

This course will engage students in individual and/or team design activities in various technological contexts. Students will apply the technological problem solving process and develop critical thinking skills. These skills are applied in the researching, designing, prototyping, testing, and the modification of product(s). This can be accomplished through various laboratory instructional strategies utilizing the seven contexts of technological literacy. Instruction should be enriched through participation in Kentucky Technology Student Association challenges. This course may be 18 or 36 weeks in duration.

(This course derives content from the CATTS Impacts of Technology and CATTS Introduction to Engineering guides)

Academic Expectations	SCANS	Content/Process	Standards for Technological Literacy
OH: 1.11, 1.16, 1.3, 2.1, 2.18, 2.2, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3	C2, C5, C9, C13, C15, C16, C17, C19, F1, F2, F7, F9, F12	**Students will:** • Define design and describe the design process	OH1-4

OJ: 1.1, 2.1, 5.1, 5.3, 6.1, 6.2, 6.3 OL: 1.1, 1.11, 1.12, 1.16, 2.2, 2.3, 3.2, 4.1, 5.1, 5.3, 5.5, 6.1, 6.2	C1, C2, C3, C4, C5, C6, C7, C8, C9, C15, C16, C18, C19, C20, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F15	• Engage in meaningful, hands-on, minds-on, and conceptual technology-based activities using tools, machines, materials, and processes	OJ1-4, OL1-5
OK: 1.2, 1.3, 1.5, 2.1, 2.2, 2.37, 2.7, 5.2, 5.3, 5.4, 6.1, 6.2	C3, C5, C7, C13, C15, C17, C19, C20, F1, F2, F7, F8, F9, F10, F12	• Use the design process to fabricate products related to one or more of the seven contexts of technological literacy (agriculture, bio-related, medical, construction, manufacturing, transportation, and communications)	OK1-3, 5
OK: 1.12, 2.13, 4.6, 5.2, 5.5, 6.3 OM: 1.16, 1.2, 2.1, 2.2, 2.6, 4.6, 5.1, 5.4, 6.1, 6.2, 6.3	C3, C5, C7, C8, C10, C12, C15, C16, C17, C20, F1, F2, F3, F4, F7, F9, F10, F12	• Analyze various design concepts, constraints, and processes related to product development employing critical thinking skills	OK4, 6, OM1-4
AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 AB: 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5 EC: 1.12, 1.3, 4.4, 5.4, 5.5,	C3, C4, C5, C6, C7, C8, C9, C12, C15, C17, C18, C19, F1, F2, F3, F4, F5, F6, F7, F8, F9, F11, F12, F13, F17	• Work individually, in teams, or as a total class to solve design-related activities that incorporate Kentucky Core Content in the technological context	AA1-8, AB1-10, EC1-3, OC1-4

6.1 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 5.4, 6.1, 6.2			
EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 EC: 1.12, 1.3, 4.4, 5.4, 5.5, 6.1 ED: 1.1, 1.11, 1.12, 1.3, 1.4, 4.4, 4.6, 5.1, 5.4 EE: 1.2, 1.3, 1.4, 4.1, 4.2, 5.4, 6.1, 6.2 EF: 1.1, 1.11, 1.12, 1.2, 1.3, 1.4, 2.17, 2.26, 3.3, 3.5, 3.6, 4.1, 4.2 4.4, 4.5, 4.6, 5.2, 5.3, 5.4 EG: 1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	C4, C5, C6, C7, C9, C10, C11, C13, C14, C16, F1, F2, F5, F6, F8, F9, F11, F12, F13, F15, F16, F17	• Identify opportunities, characteristics, and preparation requirements for current and emerging design related occupations	E1-6

EG: 1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	C1, C3, C4, C5, C6, C7, C8, C9, C11, C12, C14, C15, C16, C19, F1, F2, F5, F6, F8, F9, F11, F12, F13, F14, F15, F16, F17	• Develop personal and professional leadership skills through participation in KY TSA.	EG1-18

Connections

- Kentucky Technology Student Association (KY TSA)
- SCANS Skills
- National Technological Literacy Content Standards
- International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium

Impacts of Contemporary Technology

This course addresses the positive and negative impacts of technology and the intended and unintended results of its implementation. Students investigate and analyze critical historical and emerging issues affecting the creation, development, use and control of contemporary and future technology. Laboratory activities will allow students to propose and implement alternative solutions. Students will measure, quantify, assess, and communicate the impacts of these proposals. This can be accomplished through various classroom and laboratory instructional strategies. Instruction should be enriched through participation in Kentucky Technology Student Association challenges. This course may be 18 or 36 weeks in duration.

(This course derives content from the CATTS Technological Issues and CATTS Impacts of Technology guides)

Academic Expectations	SCANS	Content/Process	Standards for Technological Literacy
AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 EA: 1.1, 1.11,	C4, C5, C6, C7, C8, F1, F2, F5, F6, F8, F9, F11, F12, F13, F15, F17	**Students will:** • Understand and utilize communications skills to plan for and accomplish objectives/goals	AA1-8 EA1-6

1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5			
OJ: 1.1, 2.1, 5.1, 5.3, 6.1, 6.2, 6.3	C1, C2, C5, C6, C9, C15, C19, F1, F2, F3, F5, F6, F7, F8, F9, F10, F12	• Identify how the characteristics of goal-directed research impact technology	OJ1-4
1.1, 2.1, 2.25, 3.6, 4.5, 5.2, 5.4, 6.2, 1.16, 2.3, 2.33, 5.3, 6.3	C4, C11, C14, C15, F5, F8, F12, C2, C3, C19, F10	• Describe factors that motivate technological development (eg. profit, function, form, quality, etc)	OF2&3
AC: 2.18, 5.1 OD: 1.3, 2.1, 2.17, 2.18, 2.2, 2.26, 3.6, 4.5, 5.1, 5.2, 5.4, 6.2, 6.3 OI: 1.16, 2.18, 2.3, 2.33, 4.6, 5.4, 6.2	C5, C7, F2, F6, F12	• Describe factors that motivate technological development (e.g. profit, function, form, quality, etc)	AC1&2 OD1-4 OI4
OD: 1.3, 2.1, 2.17, 2.18, 2.2, 2.26, 3.6, 4.5, 5.1, 5.2, 5.4, 6.2, 6.3 OE: 1.3, 1.6, 2.1, 2.17, 2.19, 2.26, 2.33, 3.6, 4.6, 5.1, 5.3, 5.4, 6.1, 6.2, 6.3	C2, C3, C4, C5, C9, C10, C11, C14, C15, C16, C17, C18, C19, F5, F7, F8, F9, F10, F11, F12, F13, F16, F17	• Identify and explore the impacts (intended and unintended) of technological advancements in Medical, Agriculture and related biotechnologies, Energy and Power, Information and Communication, Transportation, Manufacturing, and/or Construction Technologies.	ON1-OT5
OD: 1.3, 2.1, 2.17, 2.18, 2.2, 2.26, 3.6, 4.5, 5.1, 5.2, 5.4, 6.2, 6.3 OE: 1.3, 1.6, 2.1, 2.17, 2.19, 2.26, 2.33, 3.6, 4.6, 5.1, 5.3, 5.4, 6.1, 6.2, 6.3	C2, C3, C4, C5, C9, C10, C11, C14, C15, C16, C17, C18, C19, F5, F7, F8, F9, F10, F11, F12, F13, F16, F17	• Analyze current and emerging issues (e.g., ethical, social, legal, environmental, political, and privacy) related to technology to identify appropriate and inappropriate applications of technology.	OD1-4 OE1-6 ON1-OT5

EC: 1.12, 1.3, 4.4, 5.4, 5.5, 6.1	F6, F8, F9, F12, F13, F17	• Explain and apply a system of problem-solving.	EC1-3
OA: 1.2, 1.3, 2.1, 5.1, 6.2	C5, C6, C15, C19, F9, F11, F12	• Use technological terminology correctly.	OA1
AC: 2.18, 5.1 EE: 1.2, 1.3, 1.4, 4.1, 4.2, 5.4, 6.1, 6.2	C5, C7, C11, F2, F5, F6, F9, F12, F13, F16	• Investigate and explain how business and planning components effect operations and societal impacts	AC1&2 EE1-5
EE: 1.2, 1.3, 1.4, 4.1, 4.2, 5.4, 6.1, 6.2	C7, C11, F5, F6, F9, F13, F15, F16	• Analyze workforce issues that involve ethical characteristics and behaviors.	EE1-5
1.2, 1.16, 2.1, 5.1, 6.3, 2.20, 4.6, 5.4, 6.2, 2.2, 2.6, 6.1	C5, C8, C10, F1, F10, C7, C12, C16, F9, F7, F8, F10, C3, C20	• Explore the ecological and economical impacts of unethical decisions (case studies and scenarios of regulation violations, whistle-blowing, kick-backs, pay-offs, labor disputes, illegal dumping, straight-pipe sewage, etc).	OM1-4
EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 EF: 1.1, 1.11, 1.12, 1.2, 1.3, 1.4, 2.17, 2.26, 3.3, 3.5, 3.6, 4.1, 4.2 4.4, 4.5, 4.6, 5.2, 5.3, 5.4 EG: 1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5 OE: 1.11, 1.16, 1.3, 1.6, 2.1, 2.19, 2.2, 2.3, 2.33, 4.5, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19 F1, F2, F5, F6, F7, F8, F9, F11, F12, F13, F14, F15, F16, F17	• Identify the effects of continuous quality assurance.	EF1-9 EB1-6 EG1-18 OE1-6

ED: 1.1, 1.11, 1.12, 1.3, 1.2, 4.4, 4.6, 5.1, 5.4 OK: 1.5, 2.37, 2.7, 5.2, 5.4	C3, C5, C7, C17, C20, F1, F2, F5, F6, F8, F10, F12, F15	• Utilize Core Concepts of Technology to identify social, political, and environmental impacts of technology.	ED1-3 OK5
OD: 1.3, 2.17, 3.6, 4.5, 5.1, 5.4, 6.2, 6.3 OE: 1.11, 1.16, 1.3, 1.6, 2.1, 2.19, 2.2, 2.3, 2.33, 4.5, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2	C2, C3, C4, C5, C9, C1O, C11, C15, C16, C17, C18, C19, F7, F8, F9, F11, F12, F13, F16, F17	• Design and fabricate evaluation tools (instruments, models, simulations, software) that assess the impact of products and systems through information collection and data synthesis.	OD4 OE1-6 ON1-OT5
OI: 1.11, 1.16, 1.2, 2.1, 2.17, 2.18, 2.3, 2.33, 4.5, 4.6, 5.2, 5.4, 6.2, 6.3 OM: 1.16, 1.2, 2.1, 2.2, 2.6, 4.6, 5.1, 5.4, 6.1, 6.2, 6.3	C2, C3, C4, C5, C7, C8, C10, C12, C15, C16, C17, C18, C19, C20, F1, F1, F6, F7, F8, F9, F10, F11, F12, F13, F15	• Design, construct, and assess alternative solutions to technological problems that minimize/alleviate negative impacts.	OI1-4 OM1-4
OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3 OM: 1.16, 1.2, 2.1, 2.2, 2.6, 4.6, 5.1, 5.4, 6.1, 6.2, 6.3 OE: 1.11, 1.16, 2.2, 5.3, 5.4, 6.1, 6.2	C2, C3, C4, C5, C7, C8, C10, C12, C13, C15, C16, C17, C19, C20, F1, F2, F3, F4, F7, F8, F9, F10, F12	• Develop social and professional leadership skills through participation in KY TSA.	OK1-6 OM1-4 OE4
AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 AB: 1.6, 1.8, 1.9, 2.1, 2.7, 2.8,	C3, C4, C5, C6, C7, C8, C9, C15, C17, C19, F1, F2, F3, F4, F5, F6,	• Apply concepts from Kentucky Core Concepts in the context of technology education.	AA1-8, AB1-10, OC1, OC4

2.9, 5.1, 5.4, 5.5 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2	F7, F9, F11, F12, F17		
Connections • Kentucky Technology Student Association (KY TSA) • SCANS Skills • National Technological Literacy Content Standards • International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium			

Conceptual Engineering Technology

Engineering scope, content, and professional practices are presented through practical applications in this course. Students in engineering teams apply technology and Kentucky Core Content and skills to solve engineering design problems and innovate designs. Students research, develop, test, and analyze engineering designs using criteria such as design effectiveness, public safety, human factors and ethics. Instruction should be enriched through participation in Kentucky Technology Student Association challenges. This course may be 18 or 36 weeks in duration.

(This course derives content from the CATTS Introduction to Engineering guide)

Academic Expectations	SCANS	Content/Process	Standards for Technological Literacy
AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 EF: 1.2, 1.3, 1.4, 4.1, 4.2, 4.5	C4, C5, C6, C7, C8, C9, C15, F1, F2, F5, F6, F8, F9, F11, F12, F13, F15, F17	**Students will:** • Implement effective communication and teaming techniques for the accomplishment of objectives/goals	AA1-8, EA1-6, EF1

OH: 1.11, 1.16, 1.3, 2.1, 2.18, 2.2, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3 OI: 1.11, 1.16, 1.2, 2.1, 2.17, 2.18, 2.3, 2.33, 4.5, 4.6, 5.2, 5.4, 6.2, 6.3 OE: 1.11, 1.16, 1.3, 1.6, 2.1, 2.19, 2.2, 2.3, 2.33, 4.5, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2 OF: 1.11, 1.3, 2.1, 2.17, 2.18, 2.19, 2.2, 2.25, 2.26, 2.3, 2.33, 3.6, 4.5, 5.2, 5.3, 5.4, 6.2, 6.3 OM: 1.16, 1.2, 2.1, 2.2, 2.6, 4.6, 5.1, 5.4, 6.1, 6.2, 6.3	C2, C3, C4, C5, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, F1, F2, F5, F6, F7, F8, F9, F10, F11, F12, F13, F15, F16, F17	• Evaluate designs based on function, criteria, and constraints. Identify, modify, and re-evaluate where design problems exist.	OH1-4, OI1-4, OE1-6, OF1&2, OM1-4
EF: 1.1, 1.11, 1.12, 1.2, 1.3, 1.4, 2.17, 2.26, 3.3, 3.5, 3.6, 4.1, 4.2 4.4, 4.5, 4.6, 5.2, 5.3, 5.4	C5, C6, C7, C9, C10, C11, C12, C13, C14, C15, C16, F1, F5, F6, F11, F12, F13, F15, F16, F17	• Exhibit and exercise teaming, social, and employability skills relative to careers in engineering.	EF1-9
ED: 1.1, 1.11, 1.12, 1.3, 1.4, 4.4, 4.6, 5.1, 5.4 OM: 1.16, 1.2, 2.1, 2.2, 2.6, 4.6, 5.1, 5.4, 6.1, 6.2, 6.3	C3, C5, C7, C8, C10, C11, C12, C16, C20, F1, F5, F6, F7, F8, F9, F10, F13, F15, F16	• Identify the effects of continuous quality assurance relative to human factors, safety, and ethics.	ED1-3, OM1-4
OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1,	C3, C4 C7, C8, C9, C12, C15, C17, C18, C19, C20, F2,	• Apply knowledge of the commonalities and interrelationships between	OC1-4

5.2, 6.1, 6.2	F4, F5, F6, F7, F8, F9, F11, F12, F17	design/functions of various technological systems	
OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3	C2, C3, C4, C5, C7, C13, C15, C17, C19, C20, F1, F2, F3, F4, F7, F8, F9, F10, F12	• Apply the design process to technological problem-solving	OK1-6
EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 OL: 1.1, 1.11, 1.12, 1.16, 2.2, 2.3, 3.2, 4.1, 5.1, 5.3, 5.5, 6.1, 6.2	C3, C4, C5, C7, C8, C16, C18, C19, C20, F2, F3, F4, F6, F8, F9, F11, F12, F13, F15, F16, F17	• Engage in meaningful, hands-on, minds-on, and conceptual technology-based activities using tools, machines, materials, and processes	EB1-6, OL1-5
EG: 1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	C1, C3, C4, C5, C6, C7, C8, C9, C11, C12, C14, C15, C16, C19, F1, F2, F5, F6, F8, F9, F11, F12, F13, F14, F15, F16, F17	• Develop social and professional leadership skills through participation in KY TSA.	EG1-18
AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 AB: 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2	C3, C4, C5, C6, C7, C8, C9, C15, C17, C19, F1, F2, F3, F4, F5, F6, F7, F9, F11, F12, F17	• Apply concepts from Kentucky Core Concepts in the context of technology education.	AA1-8, AB1-10, OC1, OC4

Connections

- Kentucky Technology Student Association (KY TSA)
- SCANS Skills
- National Technological Literacy Content Standards
- International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium

Special Technology Topics

Special Technology Topics allows the teacher to develop a course for in-depth exploration of technological topics. This is a laboratory-based course designed to study a technological system or topic, and/or a recent technological advancement. This study should include how this advancement affects society and/or the environment. A culminating project integrating one or more of the seven contexts of technological literacy and the Kentucky Core Content is encouraged. It should include research, design, construction, analysis, writing, and presenting. Instruction should be enriched through participation in Kentucky Technology Student Association. This course may be 18 to 36 weeks in duration.

Academic Expectations	SCANS	Content/Process	Standards for Technological Literacy
		Students will: • Apply concepts found in the Standards for Technological Literacy	All
AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 AB: 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2	C3, C4, C5, C6, C7, C8, C9, C15, C17, C19, F1, F2, F3, F4, F5, F6, F7, F9, F11, F12, F17	• Apply concepts from the Kentucky Core Content in the context of Technology Education.	AA1-8, AB1-10, OC1, OC4
EG: 1.1, 1.11, 2.36, 2.37, 2.38, 3.1, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5 AD: 1.2, 1.4, 3.1, 3.3, 3.7, 5.1, 5.3, 5.4 EB: 1.11, 1.12, 1.3,	C1, C3, C4, C5, C6, C7, C8, C9, C11, C12, C14, C15, C16, C19, F1, F2, F5, F6, F8, F9, F11, F12, F13, F14, F15 F16, F17	• Develop and demonstrate strategies and work habits that will lead to success and prepare the student for future careers in a technological world.	EG1-18, AD1-4, EB1-6

2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5			
OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3 OM: 1.16, 1.2, 2.1, 2.2, 2.6, 4.6, 5.1, 5.4, 6.1, 6.2, 6.3 OE: 1.11, 1.16, 2.2, 5.3, 5.4, 6.1, 6.2	C2, C3, C4, C5, C7, C8, C10, C12, C13, C15, C16, C17, C19, C20, F1, F2, F3, F4, F7, F8, F9, F10, F12	• Develop personal and professional leadership skills through association with KY TSA	OK1-6, OM1-4, OE4
AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 AB: 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5 EC: 1.12, 1.3, 4.4, 5.4, 5.5, 6.1 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 5.4, 6.1, 6.2	C3, C4, C5, C6, C7, C8, C9, C12, C15, C17, C18, C19, F1, F2, F3, F4, F5, F6, F7, F8, F9, F11, F12, F13, F17	• Utilize the interactive (team) process for engineering design	AA1-8, AB1-10, EC1-3, OC1-4
OD: 1.3, 2.17, 3.6, 4.5, 5.1, 5.4, 6.2, 6.3 OE: 1.11, 1.16, 1.3, 1.6, 2.1, 2.19, 2.2, 2.3, 2.33, 4.5, 4.6, 5.1, 5.2,	C2, C3, C4, C5, C9, C1O, C11, C15, C16, C17, C18, C19, F7, F8, F9, F11, F12, F13, F16,	• Use instruments to collect and analyze data	OD4, OE1-6, ON1-OT5

5.3, 5.4, 5.5, 6.1, 6.2	F17		
EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 EF: 1.1, 1.11, 1.12, 1.2, 1.3, 1.4, 2.17, 2.26, 2.29, 2.32, 3.3, 3.5, 3.6, 4.1, 4.2, 4.4, 4.5, 4.6, 5.2, 5.3, 5.4	C4, C5, C6, C7, C9, C10, C11, C13, C14, C16, F1, F2, F5, F6, F8, F9, F11, F12, F13, F15 F16, F17	• Identify current and emerging careers related to technology	EA1-6, EB1-6, EF1-9
EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 5.4, 6.1, 6.2 OO: 2.18, 2.3, 2.6 OS: 1.1, 2.3, 2.8, 5.1, 5.3, 6.1 OT: 1.11, 1.16, 2.17, 2.18, 2.3, 2.33,5.1, 5.2, 5.3, 5.4, 6.1,	C1, C2, C3, C4 C5, C6, C7, C8, C9, C11, C12, C14, C15, C16, C17, C18, C19, C20, F1, F2, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F16, F17	• Develop proficiencies in the safe, efficient, and effective use of tools, machines, materials, and processes.	EB1-6, OC1-4, OO1, OS2&4, OT2-5

6.2, 6.3			
AD: 1.2, 1.4, 3.1, 3.3, 3.7, 5.1, 5.3, 5.4, EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 OH: 1.11, 1.16, 1.3, 2.1, 2.18, 2.1, 2.2, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3 OI: 1.11, 1.16, 1.2, 2.1, 2.17, 2.18, 2.3, 2.33, 3.4, 4.5, 4.6, 5.2, 5.4, 6.2, 6.3 OJ: 1.1, 2.1, 5.1, 5.3, 6.1, 6.2, 6.3 OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3	C1, C2, C3, C4, C5, C6, C7, C9, C12, C13, C15, C16, C17, C18, C19, C20, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17	• Communicate the culminating experience/project through reflection, documentation, and various presentation techniques.	AD1-4, EA1-6, OH1-4, OI1-4, OJ1-4, OK1-6
Connections • Kentucky Technology Student Association (KY TSA) • SCANS Skills • National Technological Literacy Content Standards • International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium			

Special Problems in Technology

This independent-study course is designed to allow a High School student to study in-depth a technology topic or issue. The experience will enable the student to gain a more comprehensive knowledge of a particular technological context. A variety of instructional strategies using multiple resources, specialized laboratories, and collaboration with mentoring experts should be encouraged. Independent studies and/or internships could be utilized. Instruction should be enhanced through participation in Kentucky Technology Student Association challenges. This course may be 18 to 36 weeks in duration.

Academic Expectations	SCANS	Content/Process	Standards for Technological Literacy
AD: 1.2, 1.4, 3.1, 3.3, 3.7, 5.1, 5.3, 5.4, EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 OH: 1.11, 1.16, 1.3, 2.1, 2.18, 2.1, 2.2, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3 OI: 1.11, 1.16, 1.2, 2.1, 2.17, 2.18, 2.3, 2.33, 3.4, 4.5, 4.6, 5.2, 5.4, 6.2, 6.3 OJ: 1.1, 2.1, 5.1, 5.3, 6.1, 6.2, 6.3 OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3	C1, C2, C3, C4, C5, C6, C7, C9, C12, C13, C15, C16, C17, C18, C19, C20, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17	**Students will:** • Apply communication skills through presentations, reports, and demonstration.	AD1-4, EA1-6, OH1-4, OI1-4, OJ1-4, OK1-6

AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 AB: 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5 EC: 1.12, 1.3, 4.4, 5.4, 5.5, 6.1 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 5.4, 6.1, 6.2	C3, C4, C5, C6, C7, C8, C9, C12, C15, C17, C18, C19, F1, F2, F3, F4, F5, F6, F7, F8, F9, F11, F12, F13, F17	• apply a systems approach, research skills, (e.g., creative problem-solving, critical thinking, teamwork, leadership, acceptance of personal responsibility), and a variety of resources including information, tools and materials to the resolution of a work-based or community-based problem.	AA1-8, AB1-10, EC1-3, OC1-4
EC: 1.12, 1.3, 4.4, 5.4, 5.5, 6.1 OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3	C2, C3, C4, C5, C7, C13, C15, C17, C19, C20, F1, F2, F3, F4, F6, F7, F8, F9, F12, F13, F17	• demonstrate a thorough understanding of technological contexts and their interrelationships and impacts.	EC1-3, OK1-6
OD: 1.3, 2.17, 3.6, 4.5, 5.1, 5.4, 6.2, 6.3 OE: 1.11, 1.16, 1.3, 1.6, 2.1, 2.19, 2.2, 2.3, 2.33, 4.5, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5,	C2, C3, C4, C5, C9, C1O, C11, C15, C16, C17, C18, C19, F7, F8, F9, F11, F12, F13, F16, F17	• use contemporary technologies to communicate, process, manipulate, collect, and apply information to solve technical problems.	OD4 OE1-6 ON1-OT5

6.1, 6.2			
AA: 1.1, 1.11, 1.12, 1.16, 1.2, 1.3, 1.4, 2.31, 2.32, 3.4, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 AB: 1.6, 1.8, 1.9, 2.1, 2.7, 2.8, 2.9, 5.1, 5.4, 5.5 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 6.1, 6.2	C3, C4, C5, C6, C7, C8, C9, C15, C17, C19, F1, F2, F3, F4, F5, F6, F7, F9, F11, F12, F17	• integrate and apply concepts from the Kentucky Core Content in the context of contemporary technology.	AA1-8, AB1-10, OC1, OC4
EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 OC: 1.11, 1.16, 2.1, 2.18, 4.2, 5.1, 5.2, 5.4, 6.1, 6.2 OO: 2.18, 2.3, 2.6 OS: 1.1, 2.3, 2.8, 5.1, 5.3, 6.1 OT: 1.11, 1.16, 2.17, 2.18, 2.3, 2.33,5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3	C1, C2,C3, C4, C5, C6, C7, C8, C9, C11, C12, C14, C15, C16, C17, C18, C19, C20, F1, F2, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F16, F17	• demonstrate proficiency in the safe, efficient, and effective use of tools, machines, materials, and processes.	EB1-6, OC1-4, OO1, OS2&4, OT2-5
OM: 2.1, 2.2, 2.6, 6.1 OQ: 1.12, 1.16, 2.1, 2.17, 2.18, 2.3, 4.1, 4.2,	C1, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13,	• develop and demonstrate strategies and work habits that will lead to success and prepare the student for future careers in a technological world.	OM4, OQ3-6 EA1-6, EB1-6, EF1-9, EG1-18

4.5, 5.1, 5.4, 5.5, 6.2, 6.3 EA: 1.1, 1.11, 1.12, 1.2, 1.4, 2.26, 3.3, 3.4, 3.7, 5.1, 4.1, 4.2, 4.3, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5 EB: 1.11, 1.12, 1.3, 2.31, 2.33, 3.2, 4.3, 4.4, 5.4, 5.5 EF: 1.1, 1.11, 1.12, 1.2, 1.3, 1.4, 2.17, 2.26, 2.29, 2.32, 3.3, 3.5, 3.6, 4.1, 4.4, 4.5, 4.6, 5.2, 5.4 EG: 1.1, 1.1, 2.37, 2.38, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.4, 5.5	C14, C15, C16, C17, C18, C19, F1, F2, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17		
OK: 1.12, 1.2, 1.3, 1.5, 2.1, 2.13, 2.2, 2.37, 2.7, 4.6, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3 OM: 1.16, 1.2, 2.1, 2.2, 2.6, 4.6, 5.1, 5.4, 6.1, 6.2, 6.3 OE: 1.11, 1.16, 2.2, 5.3, 5.4, 6.1, 6.2	C2, C3, C4, C5, C7, C8, C10, C12, C13, C15, C16, C17, C19, C20, F1, F2, F3, F4, F7, F8, F9, F10, F12	• develop social and professional leadership skills through participation in KY TSA.	OK1-6 OM1-4 OE4

Connections

- Kentucky Technology Student Association (KY TSA)
- SCANS Skills
- National Technological Literacy Content Standards
- International Technology Education Association Center for the Advancement of Teaching Technology and Science (ITEA-CATTS) Consortium

High School Courses

(Career Major: Pre-Engineering)

Project Lead the Way

Project Lead The Way is a commercially produced program that consists of a carefully sequenced series of courses. It is a project-based curriculum that challenges students of all ability levels to use mathematical, scientific, and technological principles to solve real-world problems. Students will understand how technological systems relate to the economy, individual lifestyles, standards of living, and careers choices. As a result, students will be well prepared for the rigorous college curriculum that leads to a career in engineering or related fields. Instruction shall be enriched through participation in Kentucky Technology Student Association challenges. For further information, contact Project Lead The Way at http://www.pltw.org/aindex.htm.

The Project Lead The Way courses are designed to address all Technological Literacy Standards. As such, they also address the requirements of the SCANS Report and the Kentucky Academic Expectations.

As of Spring, 2004, the complete High School program of Project Lead The Way consisted of the following courses:

- Introduction to Engineering Design
- Digital Electronics
- Principles of Engineering
- Computer Integrated Manufacturing
- Civil Engineering and Architecture
- Bio-technical Engineering (in development)
- Aerospace Technology (in development)
- Engineering Design and Development

Any school wishing to pursue the Pre-Engineering major should contact the Project Lead The Way organization for a current listing of courses, required teacher training, tools, materials and other components of the program. Although other organizations may be formed with various curriculum materials in the future, **Project Lead The Way should be considered the only option for fulfilling the Pre-Engineering career major for this Curricular Framework.**

TEACHER CERTIFICATION

Technology Education Middle/High School Teachers

(16 KAR 2:010. Kentucky teaching certificates.)

Teacher certification for teaching technology education middle school courses:

Introduction to Technology
Technology Invention and Innovations
Technology Systems
Special Technology Topics

is as follows:

Grade 6:	AM95 Approval for teaching industrial education orientation and exploration levels grades 5-6
Grades 6-8:	M95 Endorsement for teaching industrial education orientation and exploration levels grades 5-8
Grades 7-12:	Certification for teaching in grades 7-12 with one of the following specialization: A94 area or B94 major: industrial arts A95 area or B95 major: industrial education orientation and exploration levels
Grades 5-12:	A99 technology education KTE technology education

Teacher certification for teaching high school technology education courses:

Grade Level: 9-12

Technology Concepts
Technology Design and Applications
Impacts of Contemporary Technology
Conceptual Engineering Technology
Special Problems in Technology Education
Special Technology Topics

And

Pre-Engineering (Project Lead the Way)

Must include grades 5-12 or 9-12 certification with one of the following specializations:

A94 area or B94 major: industrial arts
A95 area or B95 major: industrial education orientation and exploration levels
A99 technology education
KTE technology education

REFERENCES

International Technology Education Association (2000). Standards for technological literacy: Content for the study of technology, Reston, VA Author.

Volti, R. (2001). Society and Technological Change, Worth Publishers, New York

Woodward, C. M., 1898. Manual Training In General Education, New York: Scribner & Welford.

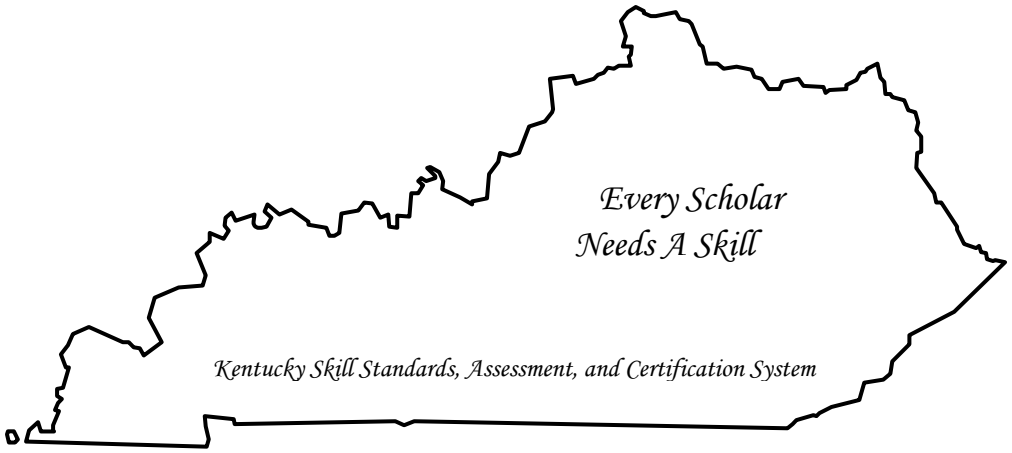
LaPorte, J. E. & Sanders, M. E. 1995. Integrating Technology, Science, and Mathematics Education. (pp. 179-219). Council on Technology Teacher Education, 44th Yearbook. New York: Glencoe

APPENDIX

Kentucky

Middle School Technology Education

Standards



Standards for Technological Literacy
International Technology Education Association

	TECHNOLOGICAL LITERACY STANDARDS
A	THE CHARACTERISTICS AND SCOPE OF TECHNOLOGY
A1	Usefulness of technology.
A2	Development of technology.
A3	Human creativity and motivation.
A4	Product demand.
B	THE CORE CONCEPTS OF TECHNOLOGY
B1	Systems.
B2	Resources.
B3	Requirements.
B4	Trade-offs.
B5	Processes.
B6	Controls.
C	RELATIONSHIPS AMONG TECHNOLOGIES AND THE CONNECTIONS BETWEEN TECHNOLOGY AND OTHER FIELDS
C1	Interaction of systems.
C2	Interrelation of technological environments.
C3	Knowledge from other fields of study and technology.
D	THE CULTURAL, SOCIAL, ECONOMIC, AND POLITICAL EFFECTS OF TECHNOLOGY
D1	Attitudes toward development and use.
D2	Impacts and consequences.
D3	Ethical issues.
D4	Influences on economy, politics, and culture.
E	THE EFFECTS OF TECHNOLOGY ON THE ENVIRONMENT
E1	Management of waste.
E2	Technologies repair damage.
E3	Environments vs. economic concerns.
F	THE ROLE OF SOCIETY IN THE DEVELOPMENT AND USE OF TECHNOLOGY
F1	Development driven by demands, values, and interests.
F2	Inventions and innovations.
F3	Social and cultural priorities.
F4	Acceptance and use of products and systems.
G	THE INFLUENCE OF TECHNOLOGY ON HISTORY
G1	Processes of inventions and innovations.
G2	Specialization of labor.
G3	Evolution of techniques, measurement, and resources.
G4	Technological and scientific knowledge.
H	THE ATTRIBUTES OF DESIGN
H1	Design leads to useful products and systems.
H2	There is no perfect design.
H3	Requirements.
I	ENGINEERING DESIGN
I1	Iterative
I2	Brainstorming.
I3	Modeling, testing, evaluating, and modifying.

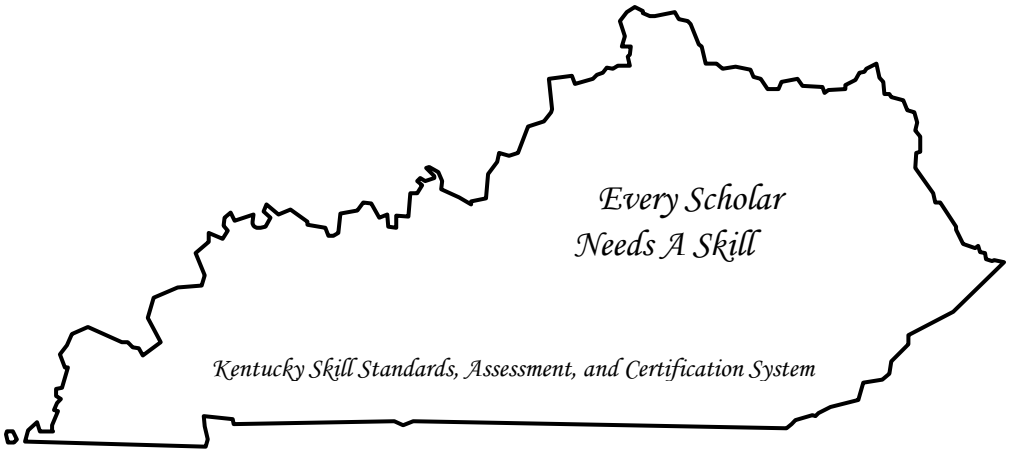
J	THE ROLE OF TROUBLESHOOTING, RESEARCH AND DEVELOPMENT, INVENTION, AND INNOVATIONS, AND EXPERIMENTATION IN PROBLEM SOLVING
J1	Troubleshooting.
J2	Invention and innovation.
J3	Experimentation.
K	APPLY DESIGN PROCESSES
K1	Apply design process.
K2	Identify criteria and constraints.
K3	Model a solution to a problem.
K4	Test and evaluate.
K5	Make a product or system.
L	USE AND MAINTAIN TECHNOLOGICAL PRODUCTS AND SYSTEMS
L1	Use information to see how things work.
L2	Safely use tools to diagnose, adjust, and repair.
L3	Use computers and calculators.
L4	Operate systems.
M	ASSESS THE IMPACT OF PRODUCTS AND SYSTEMS
M1	Design and use instruments to collect data.
M2	Use collected data to find trends.
M3	Identify trends.
M4	Interpret and evaluate accuracy of information.
N	MEDICAL TECHNOLOGIES
N1	Advances and innovations in medical technology.
N2	Sanitation processes.
N3	Immunology.
N4	Awareness about genetic engineering.
O	AGRICULTURAL AND RELATED BIOTECHNOLOGIES
O1	Technological advances in agriculture.
O2	Specialized equipment and practices.
O3	Biotechnology and agriculture.
O4	Artificial ecosystems and management.
O5	Development of refrigeration, freezing, dehydration, preservation, and irradiation.
P	ENERGY AND POWER TECHNOLOGIES
P1	Energy is the capacity to do work.
P2	Energy can be used to do work using many processes.
P3	Power is the rate at which energy is converted from one form to another.
P4	Power systems.
P5	Efficiency and conservation.
Q	INFORMATION AND COMMUNICATION
Q1	Information and communications systems.
Q2	Communication systems encode, transmit, and receive information.
Q3	Factors influencing the design of a message.
Q4	Language of technology.
R	TRANSPORTATION TECHNOLOGIES
R1	Design and operation of transportation systems.
R2	Subsystems of transportation systems.
R3	Governmental regulations.

R4	Transportation processes.
S	MANUFACTURING TECHNOLOGIES
S1	Manufacturing systems.
S2	Manufacturing goods.
S3	Manufacturing processes.
S4	Chemical technologies.
S5	Materials use.
S6	Marketing products.
T	CONSTRUCTION TECHNOLOGIES
T1	Construction designs.
T2	Foundations.
T3	Purpose of structures.
T4	Buildings systems and sub-systems.

Kentucky

Technology Education/Pre-Engineering

Skill Standards



Established by the Technology Education/Pre-Engineering
Skill Standards Task Force

July 2003

	ACADEMIC STANDARDS
AA	Communications and Teamwork
AA001	Read process information and follow instructions.
AA002	Read material and describe concepts.
AA003	Use correct pronunciation.
AA004	Use correct spelling.
AA005	Write with accuracy, brevity, and clarity.
AA006	Knowledge of conflict and resolution techniques.
AA007	Possess basic computer keyboarding skills.
AA008	Understand basics of interpersonal communication (listening, written/oral, etc.)
AB	MATH AND MEASUREMENT
AB001	Add, subtract, multiply, and divide four digit numbers with the use of a calculator.
AB002	Add, subtract, multiply, and divide four digit numbers without the use of a calculator.
AB003	Apply basic math functions to solve problems.
AB004	Convert between US and metric measurement systems.
AB005	Convert fractional measurements to decimal measurements.
AB006	Compute within measurements systems.
AB007	Document results of measurement activities and calculations.
AB008	Calculate with percents, rate, ratio, and proportion with the use of a calculator.
AB009	Make reasonable estimates of arithmetic results without the use of a calculator.
AB010	Use hand calculators.
AC	BUSINESS PLANNING AND OPERATIONS
AC001	Identify the organizational need for profit.
AC002	Define the terms “profit.”
AD	LEARNING SKILLS
AD001	Identify personal preferred learning styles.
AD002	Demonstrate ability to learn new process steps.
AD003	Implement new process steps given oral instructions.
AD004	Read process instructions and implement appropriate steps.
	EMPLOYABILITY STANDARDS
EA	COMMUNICATION AND TEAMWORK
EA001	Read documentation, such as computer manual, to determine actions for specific situations.
EA002	Organize materials with a logical flow.
EA003	Interpret and clarify directions prepared by others.
EA004	Communicate with customer to establish requirements.
EA005	Understand team concepts.
EA006	Write steps of an occupational process using sentences and statements as appropriate.
EB	WORKPLACE SAFETY AND HEALTH
EB001	Assume responsibility for the personal safety of self and others.
EB002	Maintain a clean and safe work environment.
EB003	Demonstrate a positive personal attitude towards safety.
EB004	Comply with established safety practices.
EB005	Identify fire exits and fire-fighting equipment.
EB006	Report unsafe practices to appropriate personnel.
EC	PROBLEM SOLVING
EC001	Explain the valve of applying a problem-solving system.
EC002	Apply a system of problem solving.
EC003	Identify opportunities for applying problem solving techniques.
ED	QUALITY ASSURANCE
ED001	Explain the effect of quality on profit.
ED002	Identify the effects of continuous quality improvement.
ED003	Identify your customers.
EE	BUSINESS PLANNING AND OPERATIONS
EE001	Identify the components that lead to customer satisfaction.
EE002	Identify possible actions that may lead to customer dissatisfaction.
EE003	Identify the ways that the level of customer satisfaction may affect company success.
EE004	Explain the importance of a business reputation.
EE005	Identify the ways that customer satisfaction influences a business reputation.

EF	WORKFORCE ISSUES
EF001	Recognize the difference between a team environment workplace and a conventional workplace.
EF002	Identify the characteristics of a diverse workforce.
EF003	Identify good ethical characteristics and behaviors.
EF004	Demonstrate good ethical characteristics and behaviors.
EF005	Differentiate between good and poor business ethics practices.
EF006	Match employee responsibilities to employer expectations.
EF007	Define discrimination, harassment and equity.
EF008	Demonstrate non-discriminatory behavior.
EF009	Maintain confidentiality and sensitivity of company information.
EG	WORKPLACE SKILLS
EG001	Demonstrate consistently punctual arrival.
EG002	Document regular attendance.
EG003	Demonstrate enthusiasm and confidence about work and learning new tasks.
EG004	Demonstrate appropriate dress and hygiene for successful employment.
EG005	Demonstrate the ability to act in a polite and respectful way towards co-workers.
EG006	Demonstrate the ability to complete tasks on time and accurately.
EG007	Demonstrate the ability to make career decisions.
EG008	Prepare a resume and letter of application or interest.
EG009	Fill out an application for employment.
EG010	Participate in an employment interview.
EG011	Follow directions and procedures.
EG012	Be truthful in all communications with co-workers and supervisors.
EG013	Accept constructive criticism.
EG014	Demonstrate an ability to learn new skills and behaviors.
EG015	Demonstrate a willingness to work.
EG016	Demonstrate a willingness to learn.
EG017	Work with minimal supervision.
EG018	Plan and organize work.
	OCCUPATIONAL STANDARDS
OA	THE CHARACTERISTICS AND SCOPE OF TECHNOLOGY
OA001	Nature of technology.
OA002	Rate of technological diffusion.
OA003	Goal-directed research.
OA004	Commercialization of technology.
OB	THE CORE CONCEPTS OF TECHNOLOGY
OB001	Systems.
OB002	Resources.
OB003	Requirements.
OB004	Optimization and trade-offs.
OB005	Processes.
OB006	Controls.
OC	RELATIONSHIPS AMONG TECHNOLOGIES AND THE CONNECTIONS BETWEEN TECHNOLOGY AND OTHER FIELDS
OC001	Technology transfer.
OC002	Innovation and invention.
OC003	Knowledge protection and patents.
OC004	Technological knowledge and advances of science and mathematics and vice versa.
OD	THE CULTURAL, SOCIAL, ECONOMIC, AND POLITICAL EFFECTS OF TECHNOLOGY
OD001	Rapid or gradual change.
OD002	Trade-offs and effects.
OD003	Ethical implications.
OD004	Cultural, social, economic, and political changes.
OE	THE EFFECTS OF TECHNOLOGY ON THE ENVIRONMENT
OE001	Conservation.
OE002	Reduce resource use.
OE003	Monitor environment.
OE004	Alignment of natural and technological processes.

OE005	Reduce negative consequences of technology.
OE006	Decisions and trade-offs.
OF	THE ROLE OF SOCIETY IN THE DEVELOPMENT AND USE OF TECHNOLOGY
OF001	Different cultures and technologies.
OF002	Development decisions.
OF003	Factors affecting designs and demands of technologies.
OG	THE INFLUENCE OF TECHNOLOGY ON HISTORY
OG001	Evolutionary development of technology.
OG002	Dramatic changes in society.
OG003	History of technology.
OG004	Early technological history.
OG005	The Iron Age.
OG006	The Middle Ages.
OG007	The Renaissance.
OG008	The Industrial Revolution.
OG009	The Information Age.
OH	THE ATTRIBUTES OF DESIGN
OH001	The design process.
OH002	Design problems are usually not clear.
OH003	Designs need to be refined.
OH004	Requirements.
OI	ENGINEERING DESIGN
OI001	Design principles
OI002	Influence of personal characteristics.
OI003	Prototypes.
OI004	Factors in engineering design.
OJ	THE ROLE OF TROUBLESHOOTING, RESEARCH AND DEVELOPMENT, INVENTION, AND INNOVATIONS, AND EXPERIMENTATION IN PROBLEM SOLVING
OJ	Research and development.
OJ002	Researching technological problems.
OJ003	Not all problems are technological or can be solved.
OJ004	Multidisciplinary approach.
OK	APPLY DESIGN PROCESSES
OK001	Identify a design problem.
OK002	Identify criteria and constraints.
OK003	Refine the design.
OK004	Evaluate the design.
OK005	Develop a product or system using quality control.
OK006	Reevaluate final solution(s).
OL	USE AND MAINTAIN TECHNOLOGICAL PRODUCTS AND SYSTEMS
OL001	Document and communicate processes and procedures.
OL002	Diagnose a malfunctioning systems.
OL003	Troubleshoot and maintain systems.
OL004	Operate and maintain systems.
OL005	Use computers to communicate.
OM	ASSESS THE IMPACT OF PRODUCTS AND SYSTEMS
OM001	Collect information and judge its quality.
OM002	Synthesize data to draw conclusions.
OM003	Employ assessment techniques.
OM004	Design forecasting techniques.
ON	MEDICAL TECHNOLOGIES
ON001	Medical technologies for prevention and rehabilitation.
ON002	Telemedicine.
ON003	Genetic therapeutics.
ON004	Biochemistry.
OO	AGRICULTURAL AND RELATED BIOTECHNOLOGIES
OO001	Agricultural products and systems.
OO002	Biotechnology.

OO003	Conservation.
OO004	Engineering design and management of ecosystems.
OP	ENERGY AND POWER TECHNOLOGIES
OP001	Law of Conservation of energy.
OP002	Energy sources.
OP003	Second Law of Thermodynamics.
OP004	Renewable and non-renewable forms of energy.
OP005	Power systems are a source, a process, and a load.
OQ	INFORMATION AND COMMUNICATION
OQ001	Parts of information and communications systems.
OQ002	Information and communication systems.
OQ003	The purpose of information and communication technology
OQ004	Communication systems and subsystems.
OQ005	Many ways of communicating.
OQ006	Communication through symbols.
OR	TRANSPORTATION TECHNOLOGIES
OR001	Relationship of transportation and other technology.
OR002	Intermodalism.
OR003	Transportation services and methods.
OR004	Positive and negative impacts of transportation systems.
OR005	Transportation processes and efficiency.
OS	MANUFACTURING TECHNOLOGIES
OS001	Servicing and obsolescence.
OS002	Materials.
OS003	Durable or non-durable goods.
OS004	Manufacturing systems.
OS005	Interchangeability of parts.
OS006	Chemical technologies.
OS007	Marketing products.
OT	CONSTRUCTION TECHNOLOGIES
OT001	Infrastructure.
OT002	Construction processes and procedures.
OT003	Requirements.
OT004	Maintenance, alterations, and renovation.
OT005	Prefabricated materials.

Technology Education/Pre-Engineering Crosswalk of Skill Standards To Academic Expectations and Scans

Skill Standards		Kentucky Academic Expectations		SCANS	
	ACADEMIC STANDARDS				
AA	**Communications and Teamwork**				
AA001	**Read process information and follow instructions.**	**1.2**	**Reading**	**C5 C6 C7 F1**	**Acquires and Evaluates Information Organizes and Maintains Information Interprets and Communicates Information Reading**
AA002	**Read material and describe concepts.**	**1.2 1.10 3.4 3.7**	**Reading Classifying Resourceful and Creative Learn on One's Own**	**C7 F1 F2 F6 F11**	**Interprets and Communicates Information Reading Writing Speaking Knows How to Learn**
AA003	**Use correct pronunciation.**	**1.4 1.12**	**Listening Speaking**	**C7 F5 F6**	**Interprets and Communicates Information Listening Speaking**
AA004	**Use correct spelling.**	**1.11**	**Writing**	**C7 F2**	**Interprets and Communicates Information Writing**
AA005	**Write with accuracy, brevity, and clarity.**	**1.11**	**Writing**	**C7 F2**	**Interprets and Communicates Information Writing**
AA006	**Knowledge of conflict and resolution techniques.**	**2.31 2.32 4.1 4.2 4.3 4.4 4.5 4.6**	**Physical Wellness Mental and Emotional Wellness Interpersonal Skills Productive Team Skills Consistent, Responsive, Caring Behavior Rights and Responsibilities Multicultural Sensitivity Open Mind to alternative Perspectives**	**F1 F5 F11**	**Reading Listening Knows How to Learn**
AA007	**Possess basic computer keyboarding skills.**	**1.16**	**Using Electronic Technology**	**C8 F1**	**Uses Computers to Process Information Reading**
AA008	**Understand basics of interpersonal communication (listening, written/oral, etc.)**	**1.2 1.3 1.4 1.11 1.12**	**Reading Observing Listening Writing Speaking**	**C7 F1 F2 F5 F6**	**Interprets and Communicates information Reading Writing Listening Speaking**
AB	**MATH AND MEASUREMENT**				
AB001	**Add, subtract, multiply, and divide four digit numbers with the use of a calculator.**	**2.7 2.8**	**Number Mathematical Procedures**	**F3**	**Arithmetic**

Skill Standards		Kentucky Academic Expectations		SCANS	
AB002	Add, subtract, multiply, and divide four digit numbers without the use of a calculator.	2.7 2.8	Number Mathematical Procedures	F3	Arithmetic
AB003	Apply basic math functions to solve problems.	2.7 2.8 2.9 2.10 5.5	Number Mathematical Procedures Space and Dimensionality Measurement Problem Solving	F3 F4 F9	Arithmetic Mathematics Problem Solving
AB004	Convert between US and metric measurement systems.	2.7 2.8 2.10 5.1	Number Mathematical Procedures Measurement Critical Thinking	F3 F4 F9	Arithmetic Mathematics Problem Solving
AB005	Convert fractional measurements to decimal measurements.	2.7 2.8 5.1	Number Mathematical Procedures Critical Thinking	F3 F4 F9	Arithmetic Mathematics Problem Solving
AB006	Compute within measurements systems.	1.6 1.8 1.9 5.1 5.4 5.5	Computing Measuring Mathematical Reasoning Critical Thinking Decision Making Problem Solving	F3 F4 F9	Arithmetic Mathematics Problem Solving
AB007	Document results of measurement activities and calculations.	1.6 1.8 1.9 5.1 5.4 5.5	Computing Measuring Mathematical Reasoning Critical Thinking Decision Making Problem Solving	F2 F3 F4 F9	Writing Arithmetic Mathematics Problem Solving
AB008	Calculate with percents, rate, ratio, and proportion with the use of a calculator.	1.9 5.5	Mathematical Reasoning Problem Solving	C18 C19 F3 F4 F9	Selects Technology Applies Technology to a Task Arithmetic Mathematics Problem Solving
AB009	Make reasonable estimates of arithmetic results without the use of a calculator.	1.9 5.5	Mathematical Reasoning Problem Solving	F3 F4 F9	Arithmetic Mathematics Problem Solving
AB010	Use hand calculators.	2.7 2.8 5.5	Number Mathematical Procedures Problem Solving	F3 F4 F9	Arithmetic Mathematics Problem Solving
AC	BUSINESS PLANNING AND OPERATIONS				
AC001	Identify the organizational need for profit.	2.18 5.1	Structure and Function of Economic System	C5 F2 F6 F12	Acquires and Evaluates Information Writing Speaking Reasoning

Skill Standards		Kentucky Academic Expectations		SCANS	
AC002	Define the terms "profit."	2.18	Structure and Function of Economic System	C7 F2 F6	Interprets and Communicates Information Writing Speaking
AD	LEARNING SKILLS				
AD001	Identify personal preferred learning styles.	3.1 5.4	Positive Growth in Self – Concept Task/Project Decision Making	C5 F1 F5 F11 F14 F16	Acquires and Evaluates Information Reading Listening Knows How to Learn Self – Esteem Self - Management
AD002	Demonstrate ability to learn new process steps.	3.1 3.3 3.7 5.1 5.3	Positive Growth in Self – Concept Task /Project Adaptable and Flexible Learn On One's Own Critical Thinking Conceptualizing	C6 C15 F1 F5 F9 F12	Organizes and Maintains Information Understands Systems Reading Listening Problem Solving Reasoning
AD003	Implement new process steps given oral instructions.	1.4 5.4	Listening Decision Making	C5 F5 F9	Acquires and Evaluates Information Listening Problem Solving
AD004	Read process instructions and implement appropriate steps.	1.2 5.4	Reading Decision Making	C5 F1 F9	Acquires and Evaluates Information Reading Problem Solving
	EMPLOYABILITY STANDARDS				
EA	COMMUNICATION AND TEAMWORK				
EA001	Read documentation, such as computer manual, to determine actions for specific situations.	1.2 1.10 3.7 5.4	Reading Classifying Learn On One's Own Decision Making	C5 C7 F1 F8 F12	Listening Interprets and Communicates Information Reading Decision Making Reasoning
EA002	Organize materials with a logical flow.	3.4 3.7 5.1 5.2 5.3 5.4 5.5	Resourceful and Creative Learn On One's Own Critical Thinking Creative Thinking Conceptualizing Decision Making Problem Solving	C5 F1 F2 F5 F6 F8	Acquires and Evaluates Information Reading Writing Listening Speaking Decision Making

Skill Standards		Kentucky Academic Expectations		SCANS	
EA003	Interpret and clarify directions prepared by others.	1.2 1.4 1.12 5.1	Reading Listening Speaking Critical Thinking	C5 F1 F2 F5 F6 F8 F9 F12 F13	Acquires and Evaluates Information Reading Writing Listening Speaking Decision Making Problem Solving Reasoning Responsibility
EA004	Communicate with customer to establish requirements.	1.4 1.12 3.3 4.1 4.3 4.6 5.1 5.4 5.5	Listening Speaking Adaptable and Flexible Interpersonal Skills Consistent, Responsive, Caring Behavior Open Mind to Alternative Perspectives Critical Thinking Decision Making Problem Solving	C5 F5 F6 F8 F9 F12	Acquires and Evaluates Information Listening Speaking Decision Making Problem Solving Reasoning
EA005	Understand team concepts.	1.4 1.12 2.26 3.3 4.1 4.2	Listening Speaking Diversity Adaptable and Flexible Interpersonal Skills Productive Team Skills	C4 F5 F6 F15 F17	Allocates Human Resources Listening Speaking Social Intergrity/Honesty
EA006	Write steps of an occupational process using sentences and statements as appropriate.	1.11 5.1 5.3 5.4 5.5	Writing Critical Thinking Conceptualizing Decision Making Problem Solving	F2 F12	Writing Reasoning
EB	WORKPLACE SAFETY AND HEALTH				
EB001	Assume responsibility for the personal safety of self and others.	2.31 2.33 3.2 4.3 4.4 5.4 5.5	Physical Wellness Community Health System Healthy Lifestyles Consistent, Responsive, Caring Behavior Rights and Responsibilities Decision Making Problem solving	F12 F13 F16 F17	Reasoning Responsibility Self-Management Integrity/Honesty
EB002	Maintain a clean and safe work environment.	4.4 5.4	Rights and Responsibilities Decision Making	F8 F12 F13	Decision Making Reasoning Responsibility
EB003	Demonstrate a positive personal attitude towards safety.	4.4 5.4	Right and Responsibilities Decision Making	F8 F12 F13 F16	Decision Making Reasoning Responsibility Self - Management

Skill Standards		Kentucky Academic Expectations		SCANS	
EB004	**Comply with established safety practices.**	**4.4 5.4 5.5**	**Rights and Responsibilities Decision Making Problem Solving**	**F8 F9 F12 F13 F16 F17**	**Decision making Problem Solving Reasoning Responsibility Self – Management Integrity/Honesty**
EB005	**Identify fire exits and fire-fighting equipment.**	**1.3**	**Observing**	**F13**	**Responsibility**
EB006	**Report unsafe practices to appropriate personnel.**	**1.3 1.11 1.12 2.31 4.4**	**Observing Writing Employability Skills Decision Making**	**F2 F6 F13 F17**	**Writing Speaking Responsibility Integrity/Honesty**
EC	**PROBLEM SOLVING**				
EC001	**Explain the value of applying a problem-solving system.**	**1.12 4.4 5.5**	**Speaking Rights and Responsibilities Problem Solving**	**F6 F9 F12 F17**	**Speaking Problem Solving Reasoning Integrity/Honesty**
EC002	**Apply a system of problem solving.**	**4.4 5.4 5.5**	**Rights and Responsibilities Decision Making Problem Solving Applying Multiple Perspectives**	**F8 F9 F12 F13 F17**	**Decision Making Problem Solving Reasoning Responsibility Integrity/Honesty**
EC003	**Identify opportunities for applying problem solving techniques.**	**1.3 4.4 5.4 5.5 6.1**	**Observing Rights and Responsibilities Decision Making Problem Solving Applying Multiple Perspectives**	**F8 F9 F12 F13**	**Decision Making Problem Solving Reasoning Responsibility**
ED	**QUALITY ASSURANCE**				
ED001	**Explain the effect of quality on profit.**	**1.11 1.12**	**Writing Speaking Physical Wellness Healthy Lifestyle**	**F2 F6**	**Writing Speaking**
ED002	**Identify the effects of continuous quality improvement.**	**1.3 1.10 4.4 4.6 5.1 5.4**	**Observing Classifying Rights and Responsibilities Open Mind to Alternative Perspectives Critical Thinking Decision Making**	**F8 F10 F12**	**Decision Making Seeing Things in the Mind's Eye Reasoning**
ED003	**Identify your customers.**	**1.3 1.4 1.12**	**Observing Listening Speaking**	**F5 F6 F8 F15**	**Listening Speaking Decision Making Social**

Skill Standards		Kentucky Academic Expectations		SCANS	
EE	**BUSINESS PLANNING AND OPERATIONS**				
EE001	**Identify the components that lead to customer satisfaction.**	**1.2 1.3 1.4 4.1 5.4 6.1**	**Reading Observing Listening Interpersonal Skills Decision Making Applying Multiple Perspectives**	**C7 C11 F5 F6 F9 F13 F15 F16**	**Interprets and Communicates Information Serves Clients/Customers Listening Speaking Problem Solving Responsibility Social Self - Management**
EE002	**Identify possible actions that may lead to customer dissatisfaction.**	**1.2 1.3 1.4 4.1 5.4 6.1**	**Reading Observing Listening Interpersonal Skills Decision Making Applying Multiple Perspectives**	**C7 C11 F5 F6 F9 F13 F16**	**Interprets and Communicates Information Serves Clients/Customers Listening Speaking Problem Solving Responsibility Self - Management**
EE003	**Identify the ways that the level of customer satisfaction may affect company success.**	**1.2 1.3 1.4 4.1 5.1 6.2**	**Reading Observing Listening Interpersonal Skills Critical Thinking Developing New Knowledge**	**C7 C11 F9**	**Interprets and Communicates Information Serves Clients/Customers Problem Solving**
EE004	**Explain the importance of a business reputation.**	**1.11 1.12**	**Writing Speaking**	**C7 C11**	**Interprets and Communicates Information Serves Clients/Customers**
EE005	**Identify the ways that customer satisfaction influences a business reputation.**	**1.2 1.3 1.4 4.1 5.4 6.1**	**Reading Observing Listening Interpersonal Skills Decision Making Applying Multiple Perspectives**	**C7 C11**	**Interprets and Communicates Information Serves Clients/Customers**
EF	**WORKFORCE ISSUES**				
EF001	**Recognize the difference between a team environment workplace and a conventional workplace.**	**1.2 1.3 1.4 4.1 4.2 4.5**	**Reading Observing Listening Interpersonal Skills Productive Team Skills Multicultural Sensitivity**	**C7 C9 C15**	**Interprets and Communicates Information Participates Understands Systems**

Skill Standards		Kentucky Academic Expectations		SCANS	
EF002	**Identify the characteristics of a diverse workforce.**	**2.17** **2.26** **4.5** **4.6** **5.3**	**Cultural Diversity** **Diversity** **Multicultural Sensitivity** **Open Mind to Alternative Perspectives** **Conceptualizing**	**C5** **C7** **C9** **C13** **F13** **F15** **F16** **F17**	**Acquires and Evaluates Information** **Interprets and Communicates Information** **Participates** **Understands System** **Responsibility** **Social** **Self – Management** **Integrity/Honesty**
EF003	**Identify good ethical characteristics and behaviors.**	**2.29** **2.32** **3.6** **5.4**	**Family Life and Parenting** **Mental and Emotional Wellness** **Ethical Values** **Creative Thinking**	**C5** **C7** **C9** **F13** **F15** **F17**	**Acquires and Evaluates Information** **Responsibility** **Social** **Integrity/Honesty**
EF004	**Demonstrate good ethical characteristics and behaviors.**	**3.6** **5.2**	**Ethical Values** **Creative Thinking**	**C5** **F13** **F15** **F17**	**Acquires and Evaluates Information** **Responsibility** **Social** **Integrity/Honesty**
EF005	**Differentiate between good and poor business ethics practices.**	**3.6** **5.2**	**Ethical Values** **Creative Thinking**	**C5** **F13** **F15** **F17**	**Acquires and Evaluates Information** **Responsibility** **Social** **Integrity/Honesty**
EF006	**Match employee responsibilities to employer expectations.**	**3.3** **4.1** **4.4**	**Adaptable and Flexible** **Interpersonal Skills** **Rights and Responsibilities**	**C6** **C7** **C11** **C16** **F5** **F6** **F11** **F12** **F13** **F16**	**Organizes and Maintains Information** **Interprets and Communicates Information** **Serves Clients/Customers** **Monitors and Corrects Performance** **Listening** **Speaking** **Knows How to Learn** **Reasoning** **Responsibility** **Self - Management**
EF007	**Define discrimination, harassment and equity.**	**1.1** **1.2** **1.3** **1.4** **1.11** **1.12**	**Accessing Sources of Information** **Reading** **Observing** **Listening** **Writing** **Speaking**	**C7** **C14** **F1** **F5** **F6** **F16** **F17**	**Interprets and Communicates Information** **Works with Cultural Diversity** **Reading** **Listening** **Speaking** **Self – Management** **Integrity/Honesty**

Skill Standards		Kentucky Academic Expectations		SCANS	
EF008	Demonstrate non-discriminatory behavior.	3.5	Self – Control and Self – Discipline	C9 C10 C13 F13 F15 F16 F17	Participates Teaches Others Negotiates to Arrive at a Decision Responsibility Social Self – Management Integrity/Honesty
EF009	Maintain confidentiality and sensitivity of company information.	3.6 5.4	Ethical Values Decision Making	C5 C6 C11 C12 F13 F16 F17	Acquires and Evaluates Information Organizes and Maintains Information Serves Clients/Customers Exercises Leadership Responsibility Self – Management Integrity/Honesty
EG	WORKPLACE SKILLS				
EG001	Demonstrate consistently punctual arrival.	3.5 4.4	Self – Control and Self – Discipline Rights and Responsibilities	F13 F16 F17	Responsibility Self – Management Integrity/Honesty
EG002	Document regular attendance.	1.11	Writing	C6 F13 F16 F17	Organizes and Maintains Information Responsibility Self – Management Integrity/Honesty
EG003	Demonstrate enthusiasm and confidence about work and learning new tasks.	2.37 3.3 3.7 4.4	Employability Skills Adaptable and Flexible Learn On One's Own Rights and Responsibilities	C9 C12 F5 F6 F11 F15 F16	Participates Exercises Leadership Listening Speaking Knows How to Learn Social Self - Management
EG004	Demonstrate appropriate dress and hygiene for successful employment.	3.5 4.4	Self – Control and Self – Discipline Rights and Responsibilities	C6 F1 F5 F16	Organizes and Maintains Information Reading Listening Self - Management
EG005	Demonstrate the ability to act in a polite and respectful way towards co-workers.	4.1 4.2 4.3 4.4 4.5 4.6	Interpersonal Skills Productive Team Skills Consistent, Responsive, Caring Behavior Rights and Responsibilities Multicultural Sensitivity Open Mind to Alternative Perspectives	F5 F6 F16	Listening Speaking Self - Management
EG006	Demonstrate the ability to complete tasks on time and accurately.	2.37 3.5 4.4	Employable Skills Self – Control and Self – Discipline Rights and Responsibilities	C6 C9 C11 C16 F13 F16 F17	Organizes and Maintains Information Participates Serves Clients/Customers Monitors and Corrects Performance Responsibility Self – Management Integrity/Honesty

Skill Standards		Kentucky Academic Expectations		SCANS	
EG007	**Demonstrate the ability to make career decisions.**	**2.36** **5.4**	**Career Path** **Decision Making**	**C5** **F8** **F11** **F13** **F14** **F16**	**Acquires and Evaluates Information** **Decision Making** **Knows How to Learn** **Responsibility** **Self – Esteem** **Self - Management**
EG008	**Prepare a resume and letter of application or interest.**	**2.38**	**Post – Secondary Opportunity Search**	**C8** **C19** **F1** **F2** **F11**	**Uses Computers to Process Information** **Applies Technology to a Task** **Reading** **Writing** **Knows How to Learn**
EG009	**Fill out an application for employment.**	**2.38**	**Post – Secondary Opportunity Search**	**C8** **C19** **F1** **F2** **F11**	**Uses Computers to Process Information** **Applies Technology to a Task** **Reading** **Writing** **Knows How to Learn**
EG010	**Participate in an employment interview.**	**2.38**	**Post – Secondary Opportunity Search**	**C8** **C19** **F1** **F2** **F11**	**Uses Computers to Process Information** **Applies Technology to a Task** **Reading** **Writing** **Know How to Learn**
EG011	**Follow directions and procedures.**	**4.4** **5.4**	**Rights and Responsibilities** **Decision Making**	**C7** **C14** **F5** **F6** **F11** **F12** **F15** **F16** **F17**	**Interprets and Communicates Information** **Works with Cultural Diversity** **Listening** **Speaking** **Know How to Learn** **Reasoning** **Social** **Self – Management** **Integrity/Honesty**
EG012	**Be truthful in all communications with co-workers and supervisors.**	**3.6** **4.3** **4.4**	**Ethical Values** **Consistent, Responsive, Caring Behavior** **Rights and Responsibilities**	**C5** **C6** **C9** **F2** **F6** **F13** **F16** **F17**	**Acquires and Evaluates Information** **Organizes and Maintains Information** **Participates** **Writing** **Speaking** **Responsibility** **Self – Management** **Integrity/Honesty**

Skill Standards		Kentucky Academic Expectations		SCANS	
EG013	Accept constructive criticism.	3.1 4.6	Positive Growth in Self – Concept Task/Project Open Mind to Alternative Perspectives	C7 C9 C12 C16 F5 F6 F11 F13 F14 F16	Interprets and Communicates Information Participates Exercises Leadership Monitors and Corrects Performance Listening Speaking Knows How to Learning Responsibility Self – Esteem Self - Management
EG014	Demonstrate an ability to learn new skills and behaviors.	2.37 3.1 3.7 5.4	Employability Skills Positive Growth in Self – Concept Task/Project Learning on One's Own Decision Making	C5 C6 C7 F11 F16	Acquires and Evaluates Information Organizes and Maintains Information Interprets and Communicates Information Knows How to Learn Self - Management
EG015	Demonstrate a willingness to work.	4.2	Productive Team Skills	C9 F9 F13 F16 F17	Participates Problem Solving Responsibility Self – Management Integrity/Honesty
EG016	Demonstrate a willingness to learn.	3.7 5.5	Learn on One's Own Problem Solving	C5 F11	Acquires and Evaluates Information Knows How to Learn
EG017	Work with minimal supervision.	2.37 3.4 3.7	Employability Skills Resourceful and Creative Lear on One's Own	F13 F16	Responsibility Self - Management
EG018	Plan and organize work.	1.1 5.1	Accessing Sources of Information Critical Thinking	C1 C3 C4 C5 C7 C15 F8 F9 F13 F16	Allocates Time Allocates Materials and Facility Resources Allocates Human Resources Acquires and Evaluates Information Interprets and Communicates Information Understands System Decision Making Problem Solving Responsibility Self - Management
	OCCUPATIONAL STANDARDS				
OA	THE CHARACTERISTICS AND SCOPE OF TECHNOLOGY				

Skill Standards		Kentucky Academic Expectations		SCANS	
OA001	**Nature of technology.**	**1.2** **1.3** **2.1** **5.1** **6.2**	**Reading** **Observing** **Nature of Science Activity** **Critical Thinking** **Developing New Knowledge**	**C5** **C6** **C15** **C19** **F9** **F11** **F12**	**Acquires and Evaluates Information** **Organizes and Maintains Information** **Understands Systems** **Applies Technology to a Task** **Problem Solving** **Knows How to Learn** **Reasoning**
OA002	**Rate of technological diffusion.**	**2.2** **5.1** **6.1** **6.2** **6.3**	**Patterns** **Critical Thinking** **Applying Multiple Perspectives** **Developing New Knowledge**	**C1** **C2** **C15** **C17** **C18** **F1** **F7** **F9**	**Allocates Time** **Allocates Money** **Understands Systems** **Improves and Designs Systems** **Selects Technology** **Reading** **Creative Thinking** **Problem Solving**
OA003	**Goal-directed research.**	**1.16** **2.3** **5.3** **6.3**	**Using Electronic Technology** **Systems and Interactions** **Conceptualizing** **Expanding Existing Knowledge**	**C7** **C17** **C19** **F7** **F8** **F9** **F12** **F13**	**Interprets and Communicates** **Information** **Improves and Designs Systems** **Applies Technology to a Task** **Creative Thinking** **Decision Making** **Problem Solving** **Reasoning** **Responsibility**
OA004	**Commercialization of technology.**	**2.13** **2.18** **5.1** **5.4** **6.3**	**Data** **Structure and Function of Social System** **Critical Thinking** **Decision Making** **Expanding Existing Knowledge**	**C1** **C2** **C3** **C4** **C11** **C12** **C15** **C19** **F7** **F8** **F12**	**Allocates Time** **Allocates Money** **Allocates Materials and Facility** **Resources** **Allocates Human Resources** **Serves Clients/Customers** **Exercises Leadership** **Understands Systems** **Applies Technology to a Task** **Creative Thinking** **Decision Making** **Reasoning**
OB	**THE CORE CONCEPTS OF TECHNOLOGY**				

Skill Standards		Kentucky Academic Expectations		SCANS	
OB001	**Systems.**	**2.1** **2.3** **5.1** **5.2** **6.2**	**Nature of Science Activity** **Systems and Interactions** **Critical Thinking** **Creative Thinking** **Developing New Knowledge**	**C4** **C5** **C14** **C15** **C16** **C17** **F1** **F2** **F4** **F8** **F13** **F15**	**Allocates Human Resources** **Acquires and Evaluates Information** **Works with Cultural Diversity** **Understands Systems** **Monitors and Corrects Performance** **Improves and Designs System** **Reading** **Writing** **Mathematics** **Decision Making** **Responsibility** **Social**
OB002	**Resources.**	**5.1** **5.4** **6.3**	**Critical Thinking** **Decision Making** **Expanding Existing Knowledge**	**C2** **C4** **C11** **C15** **C17** **F8** **F12** **F17**	**Allocates Money** **Allocates Human Resources** **Serves Clients/Customers** **Understands Systems** **Improves and Designs Systems** **Decision Making** **Reasoning** **Integrity/Honesty**
OB003	**Requirements.**	**1.16** **2.3** **5.1** **6.1**	**Using Electronic Technology** **Systems and Interactions** **Critical Thinking** **Applying Multiple Perspectives**	**C3** **C6** **C8** **C13** **C15** **F12** **F13**	**Allocates Materials and Facility** **Resources** **Organizes and Maintains Information** **Uses Computers to Process Information** **Negotiates to Arrive at a Decision** **Understands Systems** **Reasoning** **Responsibility**
OB004	**Optimization and trade-offs.**	**2.2** **5.5** **6.2**	**Patterns** **Problem Solving** **Developing New Knowledge**	**C8** **C13** **C17** **C20** **F7** **F9**	**Uses Computer to Process Information** **Negotiates to Arrive at a Decision** **Improves and Designs Systems** **Maintains and Troubleshoots** **Technology** **Creative Thinking** **Problems Solving**
OB005	**Processes.**	**1.16** **2.3** **4.3** **6.1** **6.2** **6.3**	**Using Electronic Technology** **Systems and Interactions** **Consistent, Responsive, Caring Behavior** **Applying Multiple Perspectives** **Developing New Knowledge** **Expanding Existing Knowledge**	**C7** **C8** **C13** **C16** **F5** **F6** **F13**	**Interprets and Communicates** **Information** **Uses Computers to Process Information** **Negotiates to Arrive at a Decision** **Monitors and Corrects Performance** **Listening** **Speaking** **Responsibility**

Skill Standards		Kentucky Academic Expectations		SCANS	
OB006	**Controls.**	**2.13** **2.3** **5.3** **6.2** **6.3**	**Data** **Systems and Interactions** **Conceptualizing** **Developing New Knowledge** **Expanding Existing Knowledge**	**C7** **C15** **C16** **C17** **C20** **F8** **F9** **F12**	**Interprets and Communicates** **Information** **Understands Systems** **Monitors and Corrects Performance** **Improves and Designs Systems** **Maintains and Troubleshoots** **Technology** **Decision Making** **Problem Solving** **Reasoning**
OC	**RELATIONSHIPS AMONG TECHNOLOGIES AND THE CONNECTIONS BETWEEN TECHNOLOGY AND OTHER FIELDS**				
OC001	**Technology transfer.**	**1.16** **2.1** **2.18** **5.1** **6.1** **6.2**	**Using Electronic Technology** **Nature of Science Activity** **Structure and Function of Economic System** **Critical Thinking** **Applying Multiple Perspectives** **Developing New Knowledge**	**C3** **C4** **C7** **C15** **C17** **C19** **F7** **F9** **F12**	**Allocates Materials and Facility** **Resources** **Allocates Human Resources** **Interprets and Communicates** **Information** **Understands Systems** **Improves and Designs System** **Applies Technology to a Task** **Creative Thinking** **Problem Solving** **Reasoning**
OC002	**Innovation and invention.**	**1.11** **1.16** **2.1** **4.2** **5.2** **6.2**	**Writing** **Using Electronic Technology** **Nature of Science Activity** **Productive Team Skills** **Creative Thinking** **Expanding Existing Knowledge**	**C3** **C4** **C7** **C9** **C12** **C18** **F5** **F6** **F7**	**Allocates Materials and Facility** **Resources** **Allocates Human Resources** **Interprets and Communicates** **Information** **Participates** **Exercises Leadership** **Selects Technology** **Listening** **Speaking** **Creative Thinking**
OC003	**Knowledge protection and patents.**	**1.16** **2.1** **5.1** **5.4** **6.2**	**Using Electronic Technology** **Nature of Science Activity** **Critical Thinking** **Decision Making** **Developing New Knowledge**	**C15** **F2** **F17**	**Understands Systems** **Writing** **Integrity/Honesty**

Skill Standards		Kentucky Academic Expectations		SCANS	
OC004	**Technological knowledge and advances of science and mathematics and vice versa.**	**1.16** **2.1** **2.18** **5.1** **5.4** **6.2**	**Using Electronic Technology** **Nature of Science Activity** **Structure and Function of Economic System** **Critical Thinking** **Decision Making** **Developing New Knowledge**	**C8** **C17** **C19** **F4** **F7** **F11**	**Uses Computers to Process Information** **Improves and Designs Systems** **Applies Technology to a Task** **Mathematics** **Creative Thinking** **Knows How to Learn**
OD	**THE CULTURAL, SOCIAL, ECONOMIC, AND POLITICAL EFFECTS OF TECHNOLOGY**				
OD001	**Rapid or gradual change.**	**1.3** **2.1** **2.18** **2.26** **5.2** **6.2**	**Observing** **Nature of Science Activity** **Structure and Function of Economic System** **Diversity** **Creative Thinking** **Expanding Existing Knowledge**	**C17** **C19** **F7** **F10**	**Improves and Designs Systems** **Applies Technology to a Task** **Creative Thinking** **Seeing Things in the Mind's Eye**
OD002	**Trade-offs and effects.**	**1.3** **2.2** **2.18** **4.5** **5.4** **6.3**	**Observing** **Patterns** **Structure and Function of Economic System** **Multicultural Sensitivity** **Decision Making** **Expanding Existing Knowledge**	**C5** **C11** **C14** **C17** **F8** **F13**	**Acquires and Evaluates Information** **Serves Clients/Customers** **Works with Cultural Diversity** **Improves and Designs Systems** **Decision Making** **Responsibility**
OD003	**Ethical implications.**	**1.3** **2.1** **2.17** **3.6** **5.1** **5.4** **6.2**	**Observing** **Nature of Science Activity** **Cultural Diversity** **Ethical Values** **Critical Thinking** **Decision Making** **Developing New Knowledge**	**C5** **C11** **F5** **F8** **F13** **F17**	**Acquires and Evaluates Information** **Serves Clients/Customers** **Listening** **Decision Making** **Responsibility** **Integrity/Honesty**
OD004	**Cultural, social, economic, and political changes.**	**1.3** **2.17** **3.6** **4.5** **5.1** **5.4** **6.2** **6.3**	**Observing** **Cultural Diversity** **Ethical Values** **Multicultural Sensitivity** **Critical Thinking** **Decision Making** **Developing New Knowledge** **Expanding Existing Knowledge**	**C10** **C11** **C17** **F9** **F11**	**Teaches Others** **Serves Clients/Customers** **Improves and Designs Systems** **Problem Solving** **Know How to Learn**
OE	**THE EFFECTS OF TECHNOLOGY ON THE ENVIRONMENT**				
OE001	**Conservation.**	**1.6** **2.1** **2.19** **2.33** **5.3** **6.1** **6.2**	**Computing** **Nature of Science Activity** **Relationship of Geography to Human Activity** **Community Health System** **Conceptualizing** **Applying Multiple Perspectives** **Developing New Knowledge**	**C2** **C3** **C9** **C11** **C17** **F9** **F16**	**Allocates Money** **Allocates Materials and Facility Resources** **Participates** **Serves Clients/Customers** **Improves and Designs System** **Problem Solving** **Self - Management**

Skill Standards		Kentucky Academic Expectations		SCANS	
OE002	**Reduce resource use.**	**1.3** **2.2** **2.19** **4.6** **5.1** **5.4** **6.3**	**Observing** **Patterns** **Relationship of Geography to Human Activity** **Open Mind to Alternative Perspectives** **Critical Thinking** **Decision Making** **Expanding Existing Knowledge**	**C3** **C4** **C9** **C15** **F8** **F11** **F13**	**Allocates Materials and Facility Resources** **Allocates Human Resources** **Participates** **Understands Systems** **Decision Making** **Know How to Learn** **Responsibility**
OE003	**Monitor environment.**	**1.3** **1.16** **2.3** **2.19** **5.2** **6.2**	**Observing** **Using Electronic Technology** **Systems and Interactions** **Relationship of Geography to Human Activity** **Creative Thinking** **Developing New Knowledge**	**C3** **C5** **C9** **C16** **C18** **F8**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Participates** **Monitors and Correct Performance** **Selects Technology** **Decision Making**
OE004	**Alignment of natural and technological processes.**	**1.11** **1.16** **2.2** **5.3** **5.4** **6.1** **6.2**	**Writing** **Using Electronic Technology** **Patterns** **Conceptualizing** **Decision Making** **Applying Multiple Perspectives** **Developing New Knowledge**	**C3** **C5** **C15** **C19** **F7** **F8**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Understands Systems** **Applies Technology to a Task** **Creative Thinking** **Decision Making**
OE005	**Reduce negative consequences of technology.**	**1.3** **2.1** **2.2** **4.5** **5.3** **5.5** **6.2**	**Observing** **Nature of Science Activity** **Patterns** **Multicultural Sensitivity** **Conceptualizing** **Problem Solving** **Developing New Knowledge**	**C3** **C4** **C5** **C15** **C17** **F7** **F9** **F12** **F17**	**Allocates Materials and Facility Resources** **Allocates Human Resources** **Acquires and Evaluates Information** **Understands Systems** **Improves and Designs Systems** **Creative Thinking** **Problem Solving** **Reasoning** **Integrity/Honesty**
OE006	**Decisions and trade-offs.**	**1.11** **2.1** **2.2** **2.18** **4.1** **5.4** **6.3**	**Accessing Sources of Information** **Nature of Science Activity** **Patterns** **Structure and Function of Economic System** **Interpersonal Skills** **Decision Making** **Expanding Existing Knowledge**	**C3** **C5** **C16** **C17** **F7**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Monitors and Corrects Performance** **Improves and Designs Systems** **Creative Thinking**
OF	**THE ROLE OF SOCIETY IN THE DEVELOPMENT AND USE OF TECHNOLOGY**				

Skill Standards		Kentucky Academic Expectations		SCANS	
OF001	**Different cultures and technologies.**	**1.3** **2.2** **2.3** **2.17** **2.18** **2.19** **2.26** **4.5** **5.3** **6.3**	**Observing** **Patterns** **Systems and Interactions** **Cultural Diversity** **Structure and Function of Economic System** **Relationship of Geography to Human Activity** **Diversity** **Multicultural Sensitivity** **Conceptualizing** **Expanding Existing Knowledge**	**C7** **C11** **C14** **F8** **F13**	**Interprets and Communicates Information** **Serves Clients/Customers** **Works with Cultural Diversity** **Decision Making** **Responsibility**
OF002	**Development decisions.**	**1.11** **2.1** **2.25** **3.6** **4.5** **5.2** **5.4** **6.2**	**Writing** **Nature of Science Activity** **Cultural Diversity** **Ethical Values** **Multicultural Sensitivity** **Creative Thinking** **Decision Making** **Developing New Knowledge**	**C4** **C11** **C14** **C15** **F5** **F8** **F12**	**Allocates Human Resources** **Serves Clients/Customers** **Works with Cultural Diversity** **Understands Systems** **Listening** **Decision Making** **Reasoning**
OF003	**Factors affecting designs and demands of technologies.**	**1.16** **2.3** **2.33** **3.6** **4.5** **5.3** **6.3**	**Using Electronic Technology** **Systems and Interactions** **Community Health System** **Ethical Values** **Multicultural Sensitivity** **Conceptualizing** **Expanding Existing Knowledge**	**C2** **C3** **C4** **C11** **C19** **F8** **F10**	**Allocates Money** **Allocates Materials and Facility Resources** **Allocates Human Resources** **Serves Clients/Customers** **Applies Technology to a Task** **Decision Making** **Seeing Things in the Mind's Eye**
OG	**THE INFLUENCE OF TECHNOLOGY ON HISTORY**				
OG001	**Evolutionary development of technology.**	**1.2** **1.16** **2.19** **2.20** **5.3** **6.1**	**Reading** **Using Electronic Technology** **Relationship of Geography to Human Activity** **Historical Perspective** **Conceptualizing** **Applying Multiple Perspective**	**C1** **C3** **C5** **C7** **F1** **F5** **F7** **F10**	**Allocates Time** **Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Interprets and Communicates Information** **Reading** **Listening** **Creative Thinking** **Seeing Things in the Mind's Eye**

Skill Standards		Kentucky Academic Expectations		SCANS	
OG002	Dramatic changes in society.	1.2 1.16 2.16 2.18 2.19 2.20 6.2	Reading Using Computer Structure and Function of Social System Structure and Function of Economic System Relationship of Geography to Human Activity Historical Perspective Developing New Knowledge	C3 C11 C14 C16 F9 F12	Allocates and Evaluates Information Serves Clients/Customers Works with Cultural Diversity Monitors and Corrects Performance Problem Solving Reasoning
OG003	History of technology.	1.2 1.16 2.18 2.20 5.3 5.4 6.2	Reading Using Electronic Technology Structure and Function of Economic System Historical Perspective Conceptualizing Decision Making Developing New Knowledge	C4 C7 C18 F1 F11	Allocates Human Resources Interprets and Communicates Information Selects Technology Reading Knows How to Learn
OG004	Early technological history.	1.2 1.16 2.18 2.19 2.20 5.3 6.2	Reading Using Computer Structure and Function of Economic System Relationship of Geography to Human Activity Historical Perspective Conceptualizing Developing New Knowledge	C3 C7 C17 C19 F1 F2 F9	Allocates Materials and Facility Resources Interprets and Communicates Information Improves and Designs Systems Applies Technology to a Task Reading Writing Problem Solving
OG005	The Iron Age.	1.2 1.16 2.19 2.20 5.3 6.2	Reading Using Computer Relationship of Geography to Human Activity Historical Perspective Conceptualizing Developing New Knowledge	C3 C4 C14 C16 C19 F1 F2 F11 F12	Allocates Materials and Facility Resources Allocates Human Resources Works with Cultural Diversity Monitors and Corrects Performance Applies Technology to a Task Reading Writing Knows How to Learn Reasoning
OG006	The Middle Ages.	1.2 1.16 2.18 2.19 2.20 5.3 6.2	Reading Using Computer Structure and Functions of Economic System Relationship of Geography to Human Activity Historical Perspective Conceptualizing Developing New Knowledge	C3 C4 C19 F9	Allocates Materials and Facility Resources Allocates Human Resources Applies Technology to a Task Problem Solving

Skill Standards		Kentucky Academic Expectations		SCANS	
OG007	**The Renaissance.**	**1.2** **1.16** **2.18** **2.19** **2.20** **5.3** **6.2**	**Reading** **Using Electronic Technology** **Structure and Function of Economic System** **Relationship of Geography to Human** **Activity** **Historical Perspective** **Conceptualizing** **Developing New Knowledge**	**C3** **C4** **C5** **C15** **C17** **C19** **F7** **F9** **F12**	**Allocates Materials and Facility** **Resources** **Allocates Human Resources** **Acquires and Evaluates Information** **Understands Systems** **Improves and Designs Systems** **Applies Technology to a Task** **Creative Thinking** **Problem Solving** **Reasoning**
OG008	**The Industrial Revolution.**	**1.2** **1.16** **2.18** **2.19** **2.20** **5.3** **6.2**	**Reading** **Using Electronic Technology** **Structure and Function of Economic System** **Relationship of Geography to Human** **Activity** **Historical Perspective** **Conceptualizing** **Developing New Knowledge**	**C3** **C4** **C10** **C15** **C17** **C18** **C19** **F7** **F9**	**Allocates Materials and Facility** **Resources** **Allocates Human Resources** **Teaches Others** **Understands Systems** **Improves and Designs Systems** **Selects Technology** **Applies Technology to a Task** **Creative Thinking** **Problem Solving**
OG009	**The Information Age.**	**1.2** **1.16** **2.18** **2.19** **2.20** **5.3** **6.2**	**Reading** **Using Electronic Technology** **Structure and Function of Economic System** **Relationship of Geography to Human** **Activity** **Historical Perspective** **Conceptualizing** **Developing New Knowledge**	**C1** **C2** **C3** **C4** **C8** **C9** **C14** **C15** **F7** **F9** **F12**	**Allocates Time** **Allocates Money** **Allocates Materials and Facility** **Resources** **Allocates Human Resources** **Uses Computers to Process Information** **Participates** **Works with Cultural Diversity** **Understands Systems** **Creative Thinking** **Problem Solving** **Reasoning**
OH	**THE ATTRIBUTES OF DESIGN**				
OH001	**The design process.**	**1.11** **1.16** **2.2** **2.18** **5.2** **5.4** **6.2**	**Writing** **Using Electronic Technology** **Patterns** **Structure and Function of Economic System** **Creative Thinking** **Decision Making** **Developing New Knowledge**	**C5** **C15** **F7** **F9**	**Acquires and Evaluates Information** **Understands Systems** **Creative Thinking** **Problem Solving**

Skill Standards		Kentucky Academic Expectations		SCANS	
OH002	**Design problems are usually not clear.**	**1.3** **1.16** **2.1** **5.1** **5.3** **6.1**	**Observing** **Using Electronic Technology** **Nature of Science Activity** **Critical Thinking** **Conceptualizing** **Applying Existing Knowledge**	**C2** **C5** **C13** **C15** **C17** **F1** **F2**	**Allocates Money** **Acquires and Evaluates Information** **Negotiates to Arrive at a Decision** **Understands Systems** **Improves and Designs Systems** **Reading** **Writing**
OH003	**Designs need to be refined.**	**1.3** **1.16** **2.2** **2.18** **5.3** **5.4** **6.2**	**Observing** **Using Electronic Technology** **Patterns** **Structure and Function of Economic System** **Conceptualizing** **Decision Making** **Developing New Knowledge**	**C15** **C16** **C17** **F9**	**Understands Systems** **Monitors and Corrects Performance** **Improves and Designs Systems** **Problem Solving**
OH004	**Requirements.**	**1.11** **2.2** **2.18** **5.1** **5.4** **6.3**	**Writing** **Patterns** **Structure and Function of Economic System** **Critical Thinking** **Decision Making** **Expanding Existing Knowledge**	**C9** **C16** **C19** **F9** **F12**	**Participates** **Monitors and Corrects Performance** **Applies Technology to a Task** **Problem Solving** **Reasoning**
OI	**ENGINEERING DESIGN**				
OI001	**Design principles**			**C2** **C5** **C15** **C17** **F1** **F2** **F7** **F9** **F12**	**Allocates Money** **Acquires and Evaluates Information** **Understands Systems** **Improves and Designs Systems** **Reading** **Writing** **Creative Thinking** **Problem Solving** **Reasoning**
OI002	**Influence of personal characteristics.**	**1.2** **1.11** **1.16** **2.3** **2.18** **5.4** **6.2**	**Reading** **Writing** **Using Electronic Technology** **Systems and Interactions** **Structure and Function of Economic System** **Decision Making** **Developing New Knowledge**	**C12** **C15** **F6** **F10** **F12** **F15**	**Exercises Leadership** **Understands Systems** **Speaking** **Seeing Things in the Mind's Eye** **Reasoning** **Social**
OI003	**Prototypes.**	**1.16** **2.1** **2.17** **3.4** **4.5** **5.2** **6.3**	**Using Electronic Technology** **Nature of Science Activity** **Cultural Diversity** **Resourceful and Creative** **Multicultural Sensitivity** **Creative Thinking** **Expanding Existing Knowledge**	**C7** **C17** **C19** **F9** **F10** **F11** **F12**	**Interprets and Communicates Information** **Improves and Designs Systems** **Applies Technology to a Task** **Problem Solving** **Seeing Things in the Mind's Eye** **Knows How to Learn** **Reasoning**

Skill Standards		Kentucky Academic Expectations		SCANS	
OI004	**Factors in engineering design.**	**1.16** **2.3** **2.18** **2.33** **4.6** **5.4** **6.2**	**Using Electronic Technology** **Systems and Interactions** **Structure and Function of Economic System** **Community Health System** **Open Mind to Alternative Perspectives** **Decision Making** **Developing New Knowledge**	**C2** **C3** **C4** **C18** **F7** **F9** **F12** **F13**	**Allocates Money** **Allocates Materials and Facility Resources** **Allocates Human Resources** **Selects Technology** **Creative Thinking** **Problem Solving** **Reasoning** **Responsibility**
OJ	**THE ROLE OF TROUBLESHOOTING, RESEARCH AND DEVELOPMENT, INVENTION, AND INNOVATIONS, AND EXPERIMENTATION IN PROBLEM SOLVING**				
OJ001	**Research and development.**	**1.1** **2.1** **5.1** **5.5**	**Accessing Sources of Information** **Nature of Science Activity** **Critical Thinking** **Problem Solving**	**C1** **C2** **C5** **C15** **C19** **F8** **F9**	**Allocates Time** **Allocates Money** **Acquires and Evaluates Information** **Understands System** **Applies Technology to a Task** **Decision Making** **Problem Solving**
OJ002	**Researching technological problems.**	**1.1** **5.3** **6.1** **6.2** **6.3**	**Accessing Sources of Information** **Conceptualizing** **Applying Multiple Perspectives** **Developing New Knowledge** **Expanding Existing Knowledge**	**C1** **C5** **C6** **C9** **F1** **F2** **F3** **F7** **F12**	**Allocates Time** **Acquires and Evaluates Information** **Organizes and Maintains Information** **Participates** **Reading** **Writing** **Arithmetic** **Creative Thinking** **Reasoning**
OJ003	**Not all problems are technological or can be solved.**	**2.1** **5.1** **6.2**	**Nature of Science Activity** **Critical Thinking** **Developing New Knowledge**	**C9** **C15** **F1** **F2** **F5** **F6** **F7** **F12**	**Participates** **Understands Systems** **Reading** **Writing** **Listening** **Speaking** **Creative Thinking** **Reasoning**
OJ004	**Multidisciplinary approach.**	**1.1** **6.1** **6.2** **6.3**	**Accessing Sources of Information** **Applying Multiple Perspectives** **Developing New Knowledge** **Expanding Existing Knowledge**	**C5** **C6** **C15** **C19** **F9** **F10**	**Acquires and Evaluates Information** **Organizes and Maintains Information** **Understands Systems** **Applies Technology to a Task** **Problem Solving** **Seeing Things in the Mind's Eye**
OK	**APPLY DESIGN PROCESSES**				

Skill Standards		Kentucky Academic Expectations		SCANS	
OK001	**Identify a design problem.**	**1.2** **2.1** **5.4**	**Reading** **Nature of Science Activity** **Decision Making**	**C5** **C13** **C17** **F1** **F2** **F7** **F9**	**Acquires and Evaluates Information** **Negotiates to Arrive at a Decision** **Improves and Designs Systems** **Reading** **Writing** **Creative Thinking** **Problem Solving**
OK002	**Identify criteria and constraints.**	**2.2** **5.4** **6.1** **6.2**	**Patterns** **Decision Making** **Applying Multiple Perspectives** **Developing New Knowledge**	**C2** **C3** **C4** **C7** **C17** **C20** **F1** **F2** **F9** **F12**	**Allocates Money** **Allocates Materials and Facility** **Resources** **Allocates Human Resources** **Interprets and Communicates** **Information** **Improves and Designs Systems** **Maintains and Troubleshoots** **Technology** **Reading** **Writing** **Problem Solving** **Reasoning**
OK003	**Refine the design.**	**1.3** **2.1** **5.3** **6.2**	**Observing** **Nature of Science Activity** **Conceptualizing** **Developing New Knowledge**	**C3** **C15** **C17** **C19** **C20** **F1** **F2** **F7** **F8** **F9** **F12**	**Allocates Materials and Facility** **Resources** **Understands Systems** **Improves and Designs Systems** **Applies Technology to a Task** **Maintains and Troubleshoots** **Technology** **Reading** **Writing** **Creative Thinking** **Decision Making** **Problem Solving** **Reasoning**

Skill Standards		Kentucky Academic Expectations		SCANS	
OK004	**Evaluate the design.**	**2.13** **4.6** **5.5** **6.3**	**Data** **Open Mind to Alternative Perspectives** **Problem Solving** **Expanding Existing Knowledge**	**C3** **C5** **C7** **C15** **C17** **C20** **F1** **F2** **F3** **F4** **F12**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Interprets and Communicates Information** **Understands Systems** **Improves and Designs Systems** **Maintains and Troubleshoots** **Technology** **Reading** **Writing** **Arithmetic** **Mathematics** **Reasoning**
OK005	**Develop a product or system using quality control.**	**1.5** **2.37** **2.7** **5.2** **5.4**	**Quantifying** **Employability Skills** **Number** **Creative Thinking** **Decision Making**	**C3** **C5** **C7** **C17** **C20** **F1** **F2** **F8** **F10**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Interprets and Communicates Information** **Improves and Designs Systems** **Maintains and Troubleshoots** **Technology** **Reading** **Writing** **Decision Making** **Seeing Things in the Mind's Eye**
OK006	**Reevaluate final solution(s).**	**1.12** **2.13** **5.2**	**Speaking** **Data** **Creative Thinking**	**C3** **C5** **C20** **F2** **F4** **F12**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Maintains and Troubleshoots** **Technology** **Writing** **Mathematics** **Reasoning**
OL	**USE AND MAINTAIN TECHNOLOGICAL PRODUCTS AND SYSTEMS**				
OL001	**Document and communicate processes and procedures.**	**1.11** **1.12** **1.16** **4.1** **5.3** **6.1**	**Writing** **Speaking** **Using Electronic Technology** **Interpersonal Skills** **Conceptualizing** **Applying Multiple Perspectives**	**C5** **C7** **C16** **F2** **F6** **F15**	**Acquires and Evaluates Information** **Interprets and Communicates Information** **Monitors and Corrects Performance** **Writing** **Speaking** **Social**

Skill Standards		Kentucky Academic Expectations		SCANS	
OL002	**Diagnose malfunctioning systems.**	**1.3** **2.2** **5.1** **6.1**	**Observing** **Patterns** **Critical Thinking** **Applying Multiple Perspectives**	**C3** **C7** **C16** **F2** **F3** **F9**	**Allocates Materials and Facility Resources** **Interprets and Communicates Information** **Monitors and Corrects Performance** **Writing** **Arithmetic** **Problem Solving**
OL003	**Troubleshoot and maintain systems.**	**2.3** **5.5** **6.2** **6.3**	**Systems and Interactions** **Problem Solving** **Developing New Knowledge** **Expanding Existing Knowledge**	**C7** **C20** **F9** **F12**	**Interprets and Communicates Information** **Maintains and Troubleshoots Technology** **Problem Solving** **Reasoning**
OL004	**Operate and maintain systems.**	**2.3** **3.2** **5.1** **6.1**	**Systems and Interactions** **Healthy Lifestyle** **Critical Thinking** **Applying Multiple**	**C4** **C16** **C19** **F13**	**Allocates Human Resources** **Monitors and Corrects Performance** **Applies Technology to a Task** **Responsibility**
OL005	**Use computers to communicate.**	**1.1** **1.16** **5.1** **6.2**	**Accessing Sources of Information** **Using Electronic Technology** **Critical Thinking** **Developing New Knowledge**	**C8** **C18** **F2** **F3** **F4** **F11**	**Uses Computers to Process Information** **Selects Technology** **Writing** **Arithmetic** **Mathematics** **Knows How to Learn**
OM	**ASSESS THE IMPACT OF PRODUCTS AND SYSTEMS**				
OM001	**Collect information and judge its quality.**	**1.2** **1.16** **2.1** **5.1** **6.3**	**Reading** **Using Electronic Technology** **Nature of Science Activity** **Critical Thinking** **Expanding Existing Knowledge**	**C5** **C8** **C10** **F1** **F10**	**Acquires and Evaluates Information** **Uses Computers to Process Information** **Teaches Others** **Reading** **Seeing Things in the Mind's Eye**
OM002	**Synthesize data to draw conclusions.**	**2.20** **4.6** **5.1** **5.4** **6.2**	**Historical Perspective** **Open Mind to Alternative Perspectives** **Critical Thinking** **Decision Making** **Developing New Knowledge**	**C7** **C8** **C12** **C16** **F1** **F9**	**Interprets and Communicates Information** **Participates** **Exercises Leadership** **Monitors and Corrects Performance** **Reading** **Problem Solving**
OM003	**Employ assessment techniques.**	**2.2** **5.1** **5.4** **6.2**	**Patterns** **Critical Thinking** **Decision Making** **Developing New Knowledge**	**C7** **C16** **F7** **F8** **F9** **F10**	**Interprets and Communicates Information** **Monitors and Corrects Performance** **Creative Thinking** **Decision Making** **Problem Solving** **Seeing Things in the Mind's Eye**

Skill Standards		Kentucky Academic Expectations		SCANS	
OM004	**Design forecasting techniques.**	**2.1** **2.2** **2.6** **6.1**	**Nature of Science Activity** **Patterns** **Change Over Time** **Applying Multiple Perspectives**	**C3** **C5** **C7** **C16** **C20** **F7** **F9**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Interprets and Communicates Information** **Monitors and Corrects Performance** **Maintains and Troubleshoots Technology** **Creative Thinking** **Problem Solving**
ON	**MEDICAL TECHNOLOGIES**				
ON001	**Medical technologies for prevention and rehabilitation.**	**2.6** **3.2** **6.1**	**Change Over Time** **Healthy Lifestyle** **Applying Multiple Perspectives**	**C3** **C5** **C9** **C19** **F1** **F2** **F11**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Participates** **Applies Technology to a Task** **Reading** **Writing** **Knows How to Learn**
ON002	**Telemedicine.**	**2.3** **2.30** **6.1**	**Systems and Interactions** **Consumerism** **Applying Multiple Perspectives**	**C3** **C8** **C15** **C16** **C17** **C18** **F1** **F9** **F11**	**Allocates Materials and Facility Resources** **Uses Computers to Process Information** **Understands Systems** **Monitors and Corrects Performance** **Improves and Designs Systems** **Selects Technology** **Reading** **Problem Solving** **Knows How to Learn**
ON003	**Genetic therapeutics.**	**3.1** **4.6** **6.3**	**Positive Growth in Self – Concept Task /Project** **Open Mind to Alternative Perspectives** **Expanding Existing Knowledge**	**C3** **C5** **C6** **C7** **C8** **C15** **F1** **F2** **F9** **F11** **F15** **F16** **F17**	**Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Organizes and Maintains Information** **Interprets and Communicates Information** **Uses Computer to Process Information** **Understands Systems** **Reading** **Writing** **Problem Solving** **Knows How to Learn** **Social** **Self – Management** **Integrity/Honesty**

Skill Standards		Kentucky Academic Expectations		SCANS	
ON004	**Biochemistry.**	**3.6** **4.6** **6.3**	**Ethical Values** **Open Mind to Alternative Perspectives** **Expanding Existing Knowledge**	**C3** **C5** **C6** **C7** **C8** **C15** **F1** **F2** **F9** **F11** **F15** **F16** **F17**	**Allocates Materials and Facility** **Resources** **Acquires and Evaluates Information** **Organizes and Maintains Information** **Interprets and Communicates** **Information** **Uses Computers to Process Information** **Understands Systems** **Reading** **Writing** **Problem Solving** **Knows How to Learn** **Social** **Self – Management** **Integrity/Honesty**
OO	**AGRICULTURAL AND RELATED BIOTECHNOLOGIES**				
OO001	**Agricultural products and systems.**	**2.18** **2.3** **2.6**	**Structure and Function of Economic System** **Systems and Interactions** **Change Over Time**	**C1** **C2** **C3** **C5** **C9** **C11** **C14** **C15** **F1** **F2** **F9**	**Allocates Time** **Allocates Money** **Allocates Materials and Facility** **Resources** **Acquires and Evaluates Information** **Participates** **Serves Clients/Customers** **Works with Cultural Diversity** **Understands Systems** **Reading** **Writing** **Problem Solving**
OO002	**Biotechnology.**	**2.1** **2.3** **6.2**	**Nature of Science Activity** **Systems and Interactions** **Developing New Knowledge**	**C3** **C5** **C11** **C15** **C16** **C17** **C20** **F1** **F9** **F11** **F12**	**Allocates Materials and Facility** **Resources** **Acquires and Evaluates Information** **Serves Client/Customers** **Understand Systems** **Monitors and Corrects Performance** **Improves and Designs Systems** **Maintains and Troubleshoots** **Technology** **Reading** **Writing** **Knows How to Learn** **Reasoning**

Skill Standards		Kentucky Academic Expectations		SCANS	
OO003	**Conservation.**	**2.3** **2.6** **3.6** **4.6** **6.3**	**Systems and Interactions** **Change Over Time** **Ethical Values** **Open Mind to Alternative Perspectives** **Expanding Existing Knowledge**	**C3** **C4** **C15** **C18** **F1** **F10**	**Allocates Materials and Facility Resources** **Allocates Human Resources** **Understands Systems** **Selects Technology** **Reading** **Seeing Things in the Mind's Eye**
OO004	**Engineering design and management of ecosystems.**	**1.10** **2.13** **2.3** **6.1**	**Classifying** **Data** **Systems and Interactions** **Applying Multiple Perspectives**	**C2** **C3** **C4** **C5** **C15** **C17** **C20** **F1** **F7** **F9** **F10**	**Allocates Money** **Allocates Materials and Facility Resources** **Allocates Human Resources** **Acquires and Evaluates Information** **Understands Systems** **Improves and Designs Systems** **Maintains and Troubleshoots Technology** **Reading** **Creative Thinking** **Problem Solving** **Seeing Things in the Mind's Eye**
OP	**ENERGY AND POWER TECHNOLOGIES**				
OP001	**Law of Conservation of energy.**	**1.16** **2.2** **2.18** **5.3** **6.1** **6.2**	**Using Electronic Technology** **Patterns** **Structure and Function of Economic System** **Conceptualizing** **Applying Multiple Perspectives** **Developing New Knowledge**	**C5** **C7** **C15** **C19** **F1** **F10**	**Acquires and Evaluates Information** **Interprets and Communicates Information** **Understands Systems** **Applies Technology to a Task** **Reading** **Seeing Things in the Mind's Eye**
OP002	**Energy sources.**	**1.16** **2.2** **2.33** **4.6** **5.5** **6.3**	**Using Electronic Technology** **Patterns** **Community Health System** **Open Mind to Alternative Perspectives** **Problem Solving** **Expanding Existing Knowledge**	**C4** **C5** **C15** **F1** **F3** **F9** **F12**	**Allocates Human Resources** **Acquires and Evaluates Information** **Understands Systems** **Reading** **Arithmetic** **Problem Solving** **Reasoning**
OP003	**Second Law of Thermodynamics.**	**1.3** **2.1** **2.3** **2.18** **5.5** **6.2**	**Observing** **Nature of Science Activity** **Systems and Interactions** **Structure and Function of Economic System** **Problem Solving** **Developing New Knowledge**	**C3** **C5** **C7** **C15** **C16** **F1** **F10** **F13** **F17**	**Allocates Materials Facility Resources** **Acquires and Evaluates Information** **Interprets and Communicates Information** **Understands Systems** **Monitors and Corrects Performance** **Reading** **Seeing Things in the Mind's Eye** **Responsibility** **Integrity/Honesty**

Skill Standards		Kentucky Academic Expectations		SCANS	
OP004	Renewable and non-renewable forms of energy.	1.11 2.2 2.33 5.1 5.4 6.2	Writing Patterns Community Health System Critical Thinking Decision Making Developing New Knowledge	C3 C4 C15 C19 F1 F12 F13	Allocates and Evaluates Information Allocates Human Resources Understands Systems Applies Technology to a Task Reading Reasoning Responsibility
OP005	Power systems are a source, a process, and a load.	1.3 2.1 2.3 2.18 5.3 6.2 6.3	Observing Nature of Science Activity Systems and Interactions Structure and Function of Economic Systems Conceptualizing Developing New Knowledge Expanding Existing Knowledge	C2 C3 C5 C6 C15 C17 F1 F9 F13	Allocates Money Allocates Materials and Facility Resources Acquires and Evaluates Information Organizes and Maintains Information Understands Systems Improves and Design Systems Reading Problem Solving Responsibility
OQ	INFORMATION AND COMMUNICATION				
OQ001	Parts of information and communications systems.	1.16 2.3 4.1 5.1 6.2	Using Electronic Technology Systems and Interactions Interpersonal Skills Critical Thinking Developing New Knowledge	C8 C18 C19 F1 F2 F10	Uses Computers to Process Information Selects Technology Applies Technology to a Task Reading Writing Seeing Thing in the Mind's Eye
OQ002	Information and communication systems.	1.16 2.1 4.5 5.4 6.2	Using Electronic Technology Nature of Science Activity Multicultural Sensitivity Decision Making Developing New Knowledge	C3 C8 F5 F6 F12 F15	Allocates Materials and Facility Resources Uses Computers to Process Information Listening Speaking Reasoning Social
OQ003	The purpose of information and communication technology	1.16 2.1 2.17 4.5 5.1 6.2	Using Electronic Technology Nature of Science Activity Cultural Diversity Multicultural Sensitivity Critical Thinking Developing New Knowledge	C4 C5 C6 C17 C18 C19 F5 F9 F15	Allocates Human Resources Acquires and Evaluates Information Organizes and Maintains Information Improves and Designs Systems Selects Technology Applies Technology to a Task Listening Problem Solving Social

Skill Standards		Kentucky Academic Expectations		SCANS	
OQ004	**Communication systems and subsystems.**	**1.12** **2.3** **2.18** **4.1** **5.1** **6.1** **6.2**	**Speaking** **Systems and Interactions** **Structure and Function of Economic System** **Interpersonal Skills** **Critical Thinking** **Applying Multiple Perspectives** **Developing New Knowledge**	**C8** **C11** **C15** **F5** **F6** **F12**	**Uses Computers to Process Information** **Serves Clients/Customers** **Understands Systems** **Listening** **Speaking** **Reasoning**
OQ005	**Many ways of communicating.**	**1.16** **2.17** **4.1** **4.5** **5.4** **6.2**	**Using Electronic Technology** **Cultural Diversity** **Interpersonal Skills** **Multicultural Sensitivity** **Decision Making** **Developing New Knowledge**	**C7** **C8** **F1** **F2** **F5** **F6** **F12**	**Interprets and Communicates Information** **Uses Computers to Process Information** **Reading** **Writing** **Listening** **Speaking** **Reasoning**
OQ006	**Communication through symbols.**	**1.16** **2.17** **4.2** **4.5** **5.5** **6.3**	**Using Electronic Technology** **Cultural Diversity** **Productive Team Skills** **Multicultural Sensitivity** **Problem Solving** **Expanding Existing Knowledge**	**C3** **C6** **C7** **C8** **C18** **F1** **F2** **F9**	**Allocates Materials and Facility Resources** **Organizes and Maintains Information** **Interprets and Communicates Information** **Uses Computers to Process Information** **Selects Technology** **Reading** **Writing** **Problem Solving**
OR	**TRANSPORTATION TECHNOLOGIES**				
OR001	**Relationship of transportation and other technology.**	**2.3** **2.18** **2.20**	**Systems and Interactions** **Structure and Function of Economic System** **Historical Perspective**	**C3** **F1** **F2** **F8** **F12**	**Allocates Materials and Facility Resources** **Reading** **Writing** **Decision Making** **Reasoning**
OR002	**Intermodalism.**	**2.3** **6.1**	**Systems and Interactions** **Applying Multiple Perspective**	**C3** **C6** **C9** **F8** **F12**	**Allocates Materials and Facility Resources** **Organizes and Maintains Information** **Participates** **Decision Making** **Reasoning**
OR003	**Transportation services and methods.**	**2.16** **2.6** **6.3**	**Structure and Function of Political System** **Change Over Time** **Expanding Existing Knowledge**	**C5** **C11** **F8** **F9** **F11**	**Acquires and Evaluates Information** **Serves Clients/Customers** **Decision Making** **Problem Solving** **Knows How to Learn**

Skill Standards		Kentucky Academic Expectations		SCANS	
OR004	**Positive and negative impacts of transportation systems.**	**2.16** **5.2** **6.1** **6.2**	**Structure and Function of Political System** **Creative Thinking** **Applying Multiple Perspectives** **Expanding Existing Knowledge**	**C4** **C8** **C15** **C18** **F8**	**Allocates Human Resources** **Uses Computers to Process Information** **Understands Systems** **Selects Technology** **Decision Making**
OR005	**Transportation processes and efficiency.**	**5.3** **6.2** **6.3**	**Conceptualizing** **Developing New Knowledge** **Expanding Existing Knowledge**	**C3** **C4** **C5** **C6** **C15** **C20** **F9**	**Allocates Materials and Facility Resources** **Allocates Human Resources** **Acquires and Evaluates Information** **Organizes and Maintains Information** **Understands Systems** **Maintains and Troubleshoots Technology** **Problem Solving**
OS	**MANUFACTURING TECHNOLOGIES**				
OS001	**Servicing and obsolescence.**	**1.3** **2.6** **5.1** **5.5**	**Observing** **Change Over Time** **Critical Thinking** **Problem Solving**	**C3** **C4** **C5** **C15** **C20** **F1** **F5** **F6** **F9**	**Allocates Materials and Facility Resources** **Allocates Human Resources** **Acquires and Evaluates Information** **Understands Systems** **Maintains and Troubleshoots Technology** **Reading** **Listening** **Speaking** **Problem Solving**
OS002	**Materials.**	**1.10** **2.3** **5.3** **6.1**	**Classifying** **Systems and Interactions** **Conceptualizing** **Applying Multiple Perspectives**	**C3** **C4** **C5** **C18** **F7**	**Allocates Materials and Facility Resources** **Allocates Human Resources** **Acquires and Evaluates Information** **Selects Technology** **Creative Thinking**
OS003	**Durable or non-durable goods.**	**1.3** **2.1** **6.1**	**Observing** **Nature of Science Activity** **Applying Multiple Activity**	**C2** **C3** **C5** **C6** **C11**	**Allocates Money** **Allocates Materials and Facility Resources** **Acquires and Evaluates Information** **Organizes and Maintains Information** **Serves Clients/Customers**
OS004	**Manufacturing systems.**	**2.8** **5.1** **6.1**	**Mathematical Procedures** **Critical Thinking** **Applying Multiple Perspectives**	**C4** **C5** **C6** **F7** **F9** **F12**	**Allocates Human Resources** **Acquires and Evaluates Information** **Organizes and Maintains Information** **Creative Thinking** **Problem Solving** **Reasoning**

Skill Standards		Kentucky Academic Expectations		SCANS	
OS005	Interchangeability of parts.	2.3 5.4 6.3	Systems and Interactions Decision Making Expanding Existing Knowledge	C1 C2 C5 C6	Allocates Time Allocates Money Acquires and Evaluates Information Organizes and Maintains Information
OS006	Chemical technologies.	2.4 6.1	Models and scale Applying Multiple Perspectives	C5 C6 C14	Acquires and Evaluates Information Organizes and Maintains Information Work with Cultural Diversity
OS007	Marketing products.	1.3 2.18 5.1	Observing Structure and Function of Economic System Critical Thinking	C4 C5 C6 C7 C14	Allocates Human Resources Acquires and Evaluates Information Organizes and Maintains Information Interprets and Communicates Information Works with Cultural Diversity
OT	CONSTRUCTION TECHNOLOGIES				
OT001	Infrastructure.	1.3 2.3 2.18 5.4 6.2	Observing Systems and Interactions Structure and Function of Economic System Decision Making Developing New Knowledge	C3 C6 C7 F8	Allocates Materials and Facility Resources Organizes and Maintains Information Interprets and Communicates Information Decision Making
OT002	Construction processes and procedures.	1.11 1.16 2.3 2.17 2.33 5.2 6.1	Writing Computing Systems and Interactions Cultural Diversity Community Health System Creative Thinking Applying Multiple Perspectives	C4 C6 C7 C14 C15 C16 C17	Allocates Human Resources Organizes and Maintains Information Interprets and Communicates Information Works with Cultural Diversity Understands Systems Monitors and Corrects Performance Improve and Designs Systems
OT003	Requirements.	1.16 2.1 2.18 5.1 6.2	Using Electronic Technology Nature of Science Activity Structure and Function of Economic System Critical Thinking Developing New Knowledge	C3 C15 C16 F7 F9	Allocates Materials and Facility Resources Understands Systems Monitors and Corrects Performance Creative Thinking Problem Solving
OT004	Maintenance, alterations, and renovation.	1.3 1.16 2.3 2.18 5.1 5.3 5.4 6.1	Observing Using Electronic Technology Systems and Interactions Structure and Function of Economic System Critical Thinking Conceptualizing Decision Making Applying Multiple Perspectives	C3 C5 C6 F1 F2 F7 F9	Allocates Materials and Facility Resources Acquires and Evaluates Information Organizes and Maintains Information Reading Writing Creative Thinking Problem Solving

Skill Standards		Kentucky Academic Expectations		SCANS	
OT005	**Prefabricated materials.**	**1.16** **2.3** **2.18** **5.3** **5.4** **6.2** **6.3**	**Using Electronic Technology** **Systems and Interactions** **Structure and Function of Economic System** **Conceptualizing** **Decision Making** **Developing New Knowledge** **Expanding Existing Knowledge**	**C1** **C2** **C3** **C6** **C17** **F7** **F9** **F12**	**Allocates Time** **Allocates Money** **Allocates Materials and Facility Resources** **Organizes and Maintains Information** **Improves and Designs Systems** **Creative Thinking** **Problem Solving** **Reasoning**

Kentucky's Learning Goals and Academic Expectations

GOAL 1:
Students are able to use basic communication and mathematics skills for purposes and situations they will encounter throughout their lives.

1.1 Students use reference tools such as dictionaries, almanacs, encyclopedias, and computer reference programs and research tools such as interviews and surveys to find the information they need to meet specific demands, explore interests, or solve specific problems.
1.2 Students make sense of the variety of materials they read.
1.3 Students make sense of the various things they observe.
1.4 Students make sense of the various messages to which they listen.
1.5-1.9 Students use mathematical ideas and procedures to communicate, reason, and solve problems.
1.10 Students organize information through development and use of classification rules and systems.
1.11 Students write using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.
1.12 Students speak using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.
1.13 Students make sense of ideas and communicate ideas with the visual arts.
1.14 Students make sense of ideas and communicate ideas with music.
1.15 Students make sense of and communicate ideas with movement.
1.16 Students use computers and other kinds of technology to collect, organize, and communicate information and ideas.

GOAL 2:
Students shall develop their abilities to apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies, practical living studies, and vocational studies to what they will encounter throughout their lives.

SCIENCE

2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.
2.2 Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.
2.3 Students identify and analyze systems and the ways their components work together or affect each other.
2.4 Students use the concept of scale and scientific models to explain the organization and functioning of living and nonliving things and predict other characteristics that might be observed.
2.5 Students understand that under certain conditions nature tends to remain the same or move toward a balance.
2.6 Students understand how living and nonliving things change over time and the factors that influence the changes.

MATHEMATICS

2.7 Students understand number concepts and use numbers appropriately and accurately.
2.8 Students understand various mathematical procedures and use them appropriately and accurately.
2.9 Students understand space and dimensionally concepts and use them appropriately and accurately.
2.10 Students understand measurement concepts and use measurement appropriately and accurately.
2.11 Students understand mathematical change concepts and use them appropriately and accurately.
2.12 Students understand mathematical structure concepts including the properties and logic of various mathematical systems.
2.13 Students understand and appropriately use statistics and probability.

SOCIAL STUDIES

2.14 Students understand the democratic principles of justice, equality, responsibility, and freedom and apply them to real-life situations.
2.15 Students can accurately describe various forms of government and analyze issues that relate to the rights and responsibilities of citizens in a democracy.
2.16 Students observe, analyze, and interpret human behaviors, social groupings, and institutions to better understand people and the relationships among individuals and among groups.
2.17 Students interact effectively and work cooperatively with the many ethnic and cultural groups of our nation and world.
2.18 Students understand economic principles and are able to make economic decisions that have consequences in daily living.
2.19 Students recognize and understand the relationship between people and geography and apply their knowledge in real-life situations.
2.20 Students understand, analyze, and interpret historical events, conditions, trends, and issues to develop historical perspective.
2.21 (incorporated into 2.16)

ARTS AND HUMANITIES

2.22 Students create works of art and make presentations to convey a point of view.
2.23 Students analyze their own and others' artistic products and performances using accepted standards.
2.24 Students have knowledge of major works of art, music, and literature and appreciate creativity and the contributions of the arts and humanities.
2.25 In the products they make and the performances they present, students show that they understand how time, place, and society influence the arts and humanities such as languages, literature, and history.
2.26 Through the arts and humanities, students recognize that although people are different, they share some common experiences and attitudes.
2.27 Students recognize and understand the similarities and differences among languages.
2.28 Students understand and communicate in a second language.

PRACTICAL LIVING

2.29 Students demonstrate skills that promote individual well-being and healthy family relationships.
2.30 Students evaluate consumer products and services and make effective consumer decisions.
2.31 Students demonstrate the knowledge and skills they need to remain physically healthy and to accept responsibility for their own physical well-being.
2.32 Students demonstrate strategies for becoming and remaining mentally and emotionally healthy.
2.33 Students demonstrate the skills to evaluate and use services and resources available in their community.
2.34 Students perform physical movement skills effectively in a variety of settings.
2.35 Students demonstrate knowledge and skills that promote physical activity and involvement in physical activity throughout their lives.

VOCATIONAL STUDIES

2.36 Students use strategies for choosing and preparing for a career.
2.37 Students demonstrate skills and work habits that lead to success in future schooling and work.
2.38 Students demonstrate skills such as interviewing, writing resumes, and completing applications that are needed to be accepted into college or other post-secondary training or to get a job.

GOAL 3:
Students shall develop their abilities to become self-sufficient individuals.

3.1 Students demonstrate positive growth in self-concept through appropriate tasks or projects.
3.2 Students demonstrate the ability to maintain a healthy lifestyle.
3.3 Students demonstrate the ability to be adaptable and flexible through appropriate tasks or projects.
3.4 Students demonstrate the ability to be resourceful and creative.
3.5 Students demonstrate self-control and self-discipline.
3.6 Students demonstrate the ability to make decisions based on ethical values.
3.7 Students demonstrate the ability to learn on one's own.

GOAL 4:
Students shall develop their abilities to become responsible members of a family, work group, or community, including demonstrating effectiveness in community service.

4.1 Students effectively use interpersonal skills.
4.2 Students use productive team membership skills**.**
4.3 Students individually demonstrate consistent, responsive, and caring behavior.
4.4 Students demonstrate ability to accept the rights and responsibilities for self and others.
4.5 Students demonstrate an understanding of, appreciation for, and sensitivity to a multicultural and world view.
4.6 Students demonstrate an open mind to alternative perspectives.

GOAL 5:
Students shall develop their abilities to think and solve problems in school situations and in a variety of situations they will encounter in life.

5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real-life situations.
5.2 Students use creative thinking skills to develop or invent novel, constructive ideas or products.
5.3 Students organize information to develop or change their understanding of a concept.
5.4 Students use a decision-making process to make informed decisions among options.
5.5 Students use problem-solving processes to develop solutions to relatively complex problems.

GOAL 6:
Students shall develop their abilities to connect and integrate experiences and new knowledge from all subject matter fields with what they have previously learned and build on past learning experiences to acquire new information through various media sources.

6.1 Students connect knowledge and experiences from different subject areas.
6.2 Students use what they already know to acquire new knowledge, develop new skills, or interpret new experiences.
6.3 Students expand their understanding of existing knowledge by making connections with new knowledge, skills, and experiences.

ACADEMIC EXPECTATIONS

	GOAL 1		Vocational Studies
1.1	Accessing Sources of Information	2.36	Career Path
1.2	Reading	2.37	Employability Skills
1.3	Observing	2.38	Post-Secondary Opportunity Search
1.4	Listening		
1.5	Quantifying		**GOAL 3**
1.6	Computing	3.1	Positive Growth in Self-Concept Task/Project
1.7	Visualizing	3.2	Healthy Lifestyle
1.8	Measuring	3.3	Adaptable and Flexible
1.9	Mathematical Reasoning	3.4	Resourceful and Creative
1.10	Classifying	3.5	Self-Control and Self-Discipline
1.11	Writing	3.6	Ethical Values
1.12	Speaking	3.7	Learn On One's Own
1.13	Visual Arts		**GOAL 4**
1.14	Music	4.1	Interpersonal Skills
1.15	Movement	4.2	Productive Team Skills
1.16	Using Electronic Technology	4.3	Consistent, Responsive, Caring Behavior
	GOAL 2	4.4	Rights and Responsibilities
	Science	4.5	Multicultural Sensitivity
2.1	Nature of Science Activity	4.6	Open Mind to Alternative Perspectives
2.2	Patterns		**GOAL 5**
2.3	Systems and Interactions	5.1	Critical Thinking
2.4	Models and Scale	5.2	Creative Thinking
2.5	Constancy	5.3	Conceptualizing
2.6	Change Over Time	5.4	Decision Making
	Mathematics	5.5	Problem Solving
2.7	Number		**GOAL 6**
2.8	Mathematical Procedures	6.1	Applying Multiple Perspectives
2.9	Space and Dimensionality	6.2	Developing New Knowledge
2.10	Measurement	6.3	Expanding Existing Knowledge
2.11	Change		
2.12	Mathematical Structures		
2.13	Data		
	Social Studies		
2.14	Democratic Principle		
2.15	Structure and Function of Political System		
2.16	Structure and Function of Social System		
2.17	Cultural Diversity		
2.18	Structure and Function of Economic System		
2.19	Relationship of Geography to Human Activity		
2.20	Historical Perspective		
	Arts and Humanities		
2.21	(Incorporated in 2.16)		
2.22	Convey a Point of View		
2.23	Analyze Artistic Products and Performances		
2.24	Aesthetics		
2.25	Cultural Heritage		
2.26	Diversity		
2.27	Language		
2.28	Second Language Proficiency		

	Practical Living		
2.29	Family Life and Parenting		
2.30	Consumerism		
2.31	Physical Wellness		
2.32	Mental and Emotional Wellness		
2.33	Community Health System		
2.34	Psychomotor Skills		
2.35	Lifetime Physical Activities		

SCANS
Secretary's Commission on Necessary Skills

Competencies

Resources: Identifies, organizes, plans, and allocates resources.

C1 Time – Selects goal relevant activities, ranks them, allocates time, and prepares and follows schedules.
C2 Money – Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives.
C3 Material and Facilities – Acquires, stores, allocates, and uses materials or space efficiently.
C4 Human Resources – Assesses skills and distributes work accordingly, evaluates performance and provides feedback.

Information: Acquires and uses information.

C5 Acquires and Evaluates Information.
C6 Organizes and Maintains Information.
C7 Interprets and Communicates Information.
C8 Uses Computers to Process Information.

Interpersonal: Works with others.

C9 Participates – Contributes to group effort.
C10 Teaches Others.
C11 Serves Clients/Customers – Works to satisfy customers' expectations.
C12 Exercise Leadership – Communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
C13 Negotiates – Works toward agreements involving exchange of resources, resolves divergent interests to arrive at a decision.
C14 Works with Cultural Diversity – Works well with men and women from diverse backgrounds.

Systems: Understands complex inter-relationships.

C15 Understands Systems – Knows how social, organizational, and technological systems work and operates effectively with them.
C16 Monitors and Corrects Performance – Distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions.
C17 Improves or Designs Systems – Suggests modifications to existing systems and develops new or alternative systems to improve performance.

Technology: Works with a variety of technologies.

C18 Selects Technology – Chooses procedures, tools or equipment including computers and related technologies.
C19 Applies Technology to Task – Understands overall intent and proper procedure for setup and operation of equipment.
C20 Maintains and Troubleshoots Technology – Prevents, identifies, or solves problems with equipment, including computers and other technologies.

Foundation Skills

Reads, writes, performs arithmetic and mathematical operations, listens and speaks.

F1 Reading – Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
F2 Writing – Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
F3 Arithmetic – Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.
F4 Mathematics – Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.

F5 Listening – Receives, attends to, interprets, and responds to verbal messages and other cues.

F6 Speaking – Organizes ideas and communicates orally.

Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons.

F7 Creative Thinking – Generates new ideas.

F8 Decision Making – Specifies foals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.

F9 Problem Solving – Recognizes problems and devises and implements plan of action.

F10 Seeing Thins in the Mind's Eye – Organizes, and processes symbols, pictures, graphs, objects, and other information.

F11 Knowing How to Learn – Uses efficient learning techniques to acquire and apply new knowledge and skills.

F12 Reasoning – Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.

F13 Responsibility – Exerts a high level of effort and perseveres towards goal attainment.

F14 Self-Esteem – Believes in own self-worth and maintains a positive view of self.

F15 Sociability – Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings.

F16 Self-Management – Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.

F17 Integrity/Honesty – Chooses ethical courses of action.

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